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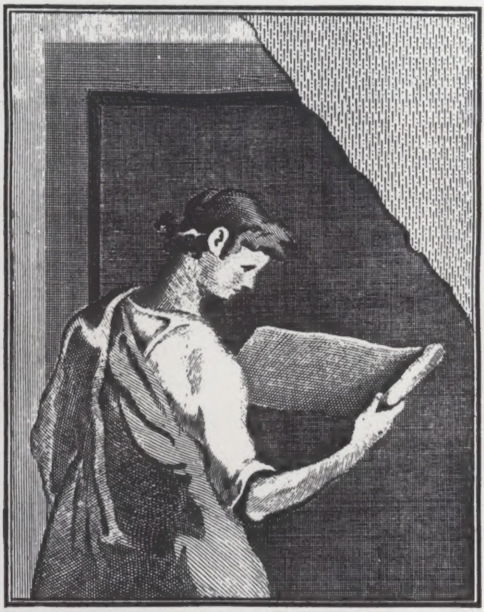

ILLUSTRATED

Annual Register

OF

RURAL AFFAIRS,

FOR

1858-9-60.

WITH 450 ENGRAVINGS.

VOL. II.

ALBANY:
LUTHER TUCKER & SON.

1884.

LOSSING-BARRITT, N.Y.

RURAL AFFAIRS:

A PRACTICAL AND COPIOUSLY

ILLUSTRATED REGISTER

OF

RURAL ECONOMY AND RURAL TASTE,

INCLUDING

COUNTRY DWELLINGS, IMPROVING AND PLANTING GROUNDS,
FRUITS AND FLOWERS, DOMESTIC ANIMALS,

AND ALL

FARM AND GARDEN PROCESSES.

By J. J. THOMAS,
AUTHOR OF THE "AMERICAN FRUIT CULTURIST," AND "FARM IMPLEMENTS,"
ASSOCIATE EDITOR OF THE "COUNTRY GENTLEMAN" AND "CULTIVATOR."

VOL. II.
FOUR HUNDRED AND FIFTY ENGRAVINGS.

ALBANY, N. Y.
LUTHER TUCKER & SON, 395 BROADWAY.
1884.

CHARLES VAN BENTHUYSEN & SONS,
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RURAL AFFAIRS.

By John J. Thomas.

PUBLISHED BY LUTHER TUCKER & SON, ALBANY, N. Y.

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INDEX.

INDEX TO ILLUSTRATIONS.

THE

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OF

RURAL AFFAIRS.

A COMPLETE COUNTRY RESIDENCE.

BRINGING together all the luxuries which a complete country residence may afford, with all the comforts and conveniences which may be combined in a single place, is of very rare but by no means difficult attainment. Such a place must comprise, besides the best household conveniences, trees and plants for the entire circle of fruits; a first-rate kitchen garden, for a full supply of the best early, medium, and late vegetables; fresh meat and poultry; and lastly, and by no means the least, the wholesome fascinations of ornamental planting. Throwing aside the costly fruits of hot-house culture, all these may be easily had at a moderate expenditure of means.

The residence of which the description is here given, includes no more than is within the reach of a large portion of farmers. The house is less in size than would satisfy many occupants; but the owner prefers to abridge his house-room by five hundred dollars in retrenchment, and expend this five hundred in fencing, ditching, deepening the soil and manuring his grounds; in planting fruit and ornamental trees; and in giving the whole that constant attention and culture, without which the best and *most profitable* results can never be reached.

The general design, and the relative size and position of each part, are readily understood from the accompanying plan (fig. 4, p. 23) of the whole. The portion of the farm covered by this plan, is about five acres. The house is seven rods from the public road—on the right are three-fourths of an acre devoted to ornamental planting; and on the left about the same is occupied with an orchard of standard pears. Immediately back of the ornamental grounds, is an acre devoted to dwarf fruit trees, currant, gooseberry and raspberry bushes, and to vegetables between the rows. Still further back is the fruit garden of standard trees, occupying nearly two acres.

The Dwelling.

The plan of the house is shown in the accompanying cuts. It fronts the south. There are three principal rooms and a bed-room below, and four

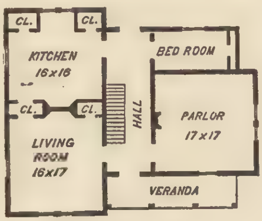


Fig. 2—First Floor.

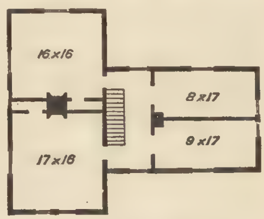


Fig. 3—Chambers.

bed-rooms above. The space, although small, comprises many conveniences. But little room is consumed by the hall, although it extends through the house, and affords every facility for ventilation in summer. No room is entered through another, but all open to the hall. The chimneys, being near the center of the house, economise the heat.

A sufficient steepness is given to the roof (see view p. 21) to prevent all danger from leakage at the receding corners.

Special attention has been taken with the *cellar*—as the safe and perfect preservation of the large supplies of apples and winter pears, and of winter vegetables, is a matter of great importance. In order to keep it easily clean and sweet, a perfectly smooth floor of water-lime is laid. This is done by first paving it with small stones, and then covering these with a coat of water-lime cement, and then a second coat to render it smooth and level. Precaution has been taken to build the wall so as to prevent rats from entering, which they sometimes do, even with a water-lime bottom, by undermining it till it breaks away. The wall is laid on a base of flagging or flat stones, a few inches below the bottom of the cellar, the base projecting from the face and rear of the wall. Whenever rats burrow down for passing beneath, they invariably work close to the stone face; and when they reach the projecting flagging, they can go no farther and give up the job.

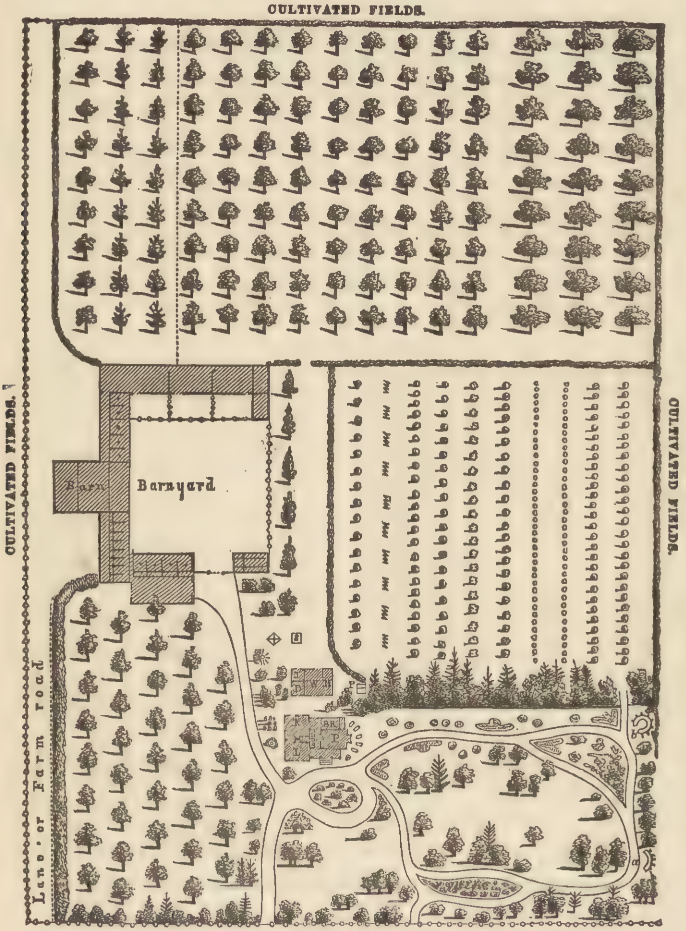


Fig. 4—Country Residence, Farm Buildings, Grounds and Fruit Gardens.

To secure the cellar from freezing, without the common disfigurement of *banking up*, that portion of the wall above ground, is built *double*—the inner wall being brick four inches thick, with a space of air two inches, and an outer wall of stone fourteen inches thick, making twenty inches in all. The brick wall is stiffened by an occasional binder across to the stone; and the vacant space is filled with ashes. Tan or sawdust, or even sand, would have probably done nearly as well. The cellar windows are all furnished with double sash for winter, admitting light, but not frost. The outer of these sashes, is removed as soon as the season for severe cold is past, and the inner one being hung on hinges, may be hooked up inside whenever fresh air is desirable. To prevent the ingress of anything from without, frames exactly the size of the outer windows, are made, and covered with wire netting; these replace the outer windows during warm weather.

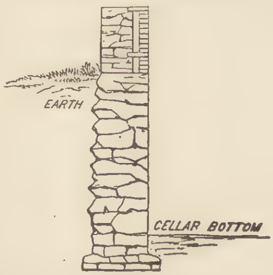


Fig. 5—Section of Cellar Wall.

This cellar is eight feet deep, and is always clean, with a pure air; and the temperature may be very nearly controlled at all times. It will consequently keep apples two or three months longer than many cellars used for this purpose, or until the season for early strawberries and cherries, so that fruit is always on hand at all seasons of the year. Fresh winter pears are preserved in the finest condition through the winter, thus prolonging the entire pear season to about nine or ten months.

A spacious rain-water cistern occupies the rear of the cellar, from which water is drawn by a pump into the kitchen above, and by a stop-cock into the cellar. This cistern is built square, of masonry, and lined inside with three coats of water lime. It is six feet deep, and is covered on the top with two-inch plank, which may be removed in part for cleaning it out.

This house may seem too small; but as three cheap laborers' cottages have been built on another part of the farm, the hired men all board and lodge themselves, and no provision for accommodating workmen is necessary. Plans of some of these cottages will be found in a subsequent part of this number of the Register.

The Grounds.

About three-fourths of an acre are devoted to the ornamental grounds. With the exception of walks and flower beds, this is green turf. The soil which it occupies was in the first place made about fifteen inches deep, by subsoil and trench plowing, and was made fertile by manure. After most of the trees were planted, it was rendered as smooth as possible, and sown early in the spring with a bushel and a half of grass seed, brushed or

lightly harrowed in. A few weeks gave it a handsome and very dense turf. During the season that grass grows most rapidly, it is mowed closely once in ten days; later in the season, once in three weeks keeps it equally short. The young trees, for a few years after setting out, were well spaded and mulched.

The gravel road for the carriage-way, is twelve feet wide. After passing to the front of the house, and around a fine piece of shrubbery, it leads to the carriage house, the nearest of the range of farm buildings.

The foot-walks are five feet wide, and pass around nearly the whole of the ornamental grounds. One opens to the public road, and thus affords a convenient and nearly direct passage to the house.

The curves in all these walks, constantly varying in abruptness, were laid out in the following manner. Their general position was first determined, by laying off by measurement from the plan furnished, a few of the principal points. The curves were then marked out, by first laying a straight pole upon the ground, in the direction which the walk takes at the start. A peg is stuck into the ground at the first end, and another at the middle; the pole is then moved a little from its position, the middle remaining the same, when another peg is stuck in at the other end. The pole is then moved forward, with the same slight side movement accurately measured; and so the process is repeated, till the walk is laid out, and marked by the curved line of pegs (fig. 6.) A greater or less side-movement of the pole will make the curve long or short. If the curve is uniform, the measurement at each time will be the same. But in passing from a short to a long curve, or *vice versa*, each successive side-measurement, must exceed or diminish by a certain amount the previous one.

Fig. 6—Laying out Curves.

The ornamental grounds are most thickly planted towards the boundaries, where likewise there is a considerable proportion of evergreen trees interspersed, for the purpose of shelter. A nearly open view is left from the house diagonally across it, towards the rustic seat at *a*, so as to show the extent of the grounds, without exhibiting more than a portion of the whole at a time; and from this seat there is a picturesque view of the house. This seat is made of red cedar boughs, closely fitted together at the joints, and is represented in fig. 7. A tree-seat, nearly in front of the

Fig. 7—Rustic Seat.

Fig. 8—Tree Seat.

Fig. 9—View across the Flower Garden.

house is shown in fig. 8. Another open view extends from the dwelling across the flower garden to the summer house at *b*. The flower beds line the walk which passes in that direction, and are cut out of the turf, and kept in the form of neatly trimmed circles, ovals, and arabesque figures. A view across a portion of this flower garden towards the house, is shown in the above figure—(fig. 9.)

The summer house at *b*, is a very simple but neat and tasteful structure, (fig. 10,) made by first inserting into the ground eight round red cedar posts, with the bark on, in the form of a circle. These are about eight inches in diameter, and seven feet above ground after being set. They are then sawed off at an equal height, and connected together by well fitting pieces of horizontal plank, nailed on the top, and an eight-sided roof of rough boards is then added, corresponding with the octagonal form of the structure. Lath is nailed diagonally from post to post, forming lattice work, except in front, where space is left for entrance. A board seat passes around the interior, being supported by brackets beneath, nailed fast to the posts. The structure as thus made, did not cost ten dollars, every part except the seats being *rough*, (the boards unplaned,) to which three coats of whitewash made brown by a mixture of ochre, had been applied in as many successive years. A more rustic as well as ornamental appearance might have been given to it, by employing the *rustic mosaic work* described in the last number of the Register.

Fig. 10—Summer House.

Except in the more remote parts of the ornamental grounds, large trees

are not planted, as they would ultimately become too large for a limited space like this, but such medium-sized and small trees as the following:— The large and red-flowering Horse Chestnut; the Dog-wood and Aronia, (the two last eminently beautiful for their profusion of early spring flowers,) the common glutinous, and honey Locust; the Siberian Crab; the double-flowering Apple; the flowering, weeping, and golden Ash; the Virgilia, Cercis, Mountain Ash, Laburnum, &c.; and the smaller evergreens, as the White Spruce, Red Cedar, Juniper, Dwarf Scotch Pine, and others of similar size. Norway and Balsam Firs, are largely planted towards the boundaries.

The oval bed in front of the house, the oblong space between the two walks near the small entrance gate, and two or three other places, are chiefly occupied with the following shrubs:—

For Early Spring Flowering—the Pink and White Mezereon; the White and Scarlet Japan Quince; the Dwarf Double-flowering Almond; and the

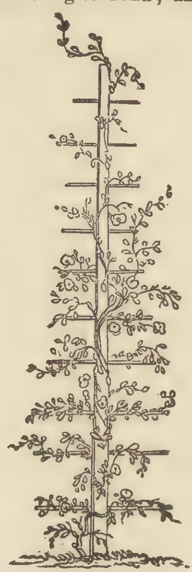


Fig. 11. SUPPORTS FOR CLIMBING ROSES. Fig. 12.

Missouri and Scarlet-flowering Currant. *Late Spring Flowering*—Tartarian Honeysuckle, pink, white and striped; Philadelphus, the large and the fragrant flowered; the common and Siberian Lilac; Silver Bell; Azalea; Fothergilla; Barberry; Rose Locust; White Fringe Tree, &c. *Early Summer Flowering*—Snowball, several Spiræas, Colutea, Laburnum, Fly

Honeysuckle, &c. *Late Summer Flowering*—Hibiscus Syriacus (Althea), Magnolia glauca, Ceanothus, Dwarf Horse Chestnut, Yellow Jasmine, Spiræa tomentosa and Douglassii, &c. The early summer roses create a brilliant display in their season, and the hybrid perpetuals, and some of the hardier bourbons and noisettes, continue in bloom till cold weather in autumn. The prairie roses are in a few instances trained as pillars, according to the manner shown in the figs. 11 and 12. The more delicate climbers are provided with such structures as fig. 13. The flower beds early in spring show a display of flowering bulbs, as snowdrops, crocuses, squills, colchicums, &c., succeeded by hyacinths, tulips, narcissus, and other hardy and showy kinds. These are followed by annual flowers, which bloom profusely later in summer and in autumn. Another portion of the flower beds is devoted to herbaceous perennials, which bloom at an intermediate season. (For more particular lists of flowering plants, the reader is referred to the two previous numbers of the Register.)

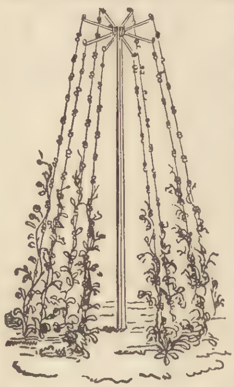


Fig. 13—Support for Vines.

Pear Orchard.

On the left or west side of the dwelling, is an orchard of forty standard pear trees, mostly of the autumn or winter sorts, early varieties not being so appropriate for so frequented a place. The following comprise these, and the number of each,—most of which being symmetrically growing trees, and planted in the hexagonal form, produce an ornamental effect, suitable for near proximity to the house:—10 Virgalieu, 5 Seckel, 5 Sheldon, 5 Lawrence, 10 Flemish Beauty, 5 Buffum. Several winter sorts are planted largely in the dwarf pear garden, among which are the Glout Morceau, Easter Beurre, Winkfield, &c. This pear orchard is protected from the west winds, and separated from the farm road, by a screen of Norway firs, which in five years from setting out, attained a height of about fourteen feet.

Another screen, mostly of evergreens of several different species, to impart variety of appearance, separates the ornamental grounds from the dwarf fruit tree and kitchen garden. The inner line of this screen is straight and kept sheared; the outer is irregular in outline, to harmonize with the rest of the planting on that side. This screen forms a fine shelter on the north side of the flower garden.

The Dwarf Garden

Is entered near the house, and also from the ornamental grounds at the summer house near *b*, through an arch made by training two trees together

Fig. 14—View of the Dwarf Pear Garden.

overhead—(fig. 15.) This garden occupies an acre, and contains in the first four rows, (counting from the west,) 80 dwarf pear trees; in the fifth row, 20 dwarf apples; in the sixth, 40 currant bushes; in the seventh, 40 gooseberry bushes; in the eighth, 15 raspberry bushes or stools, and 15 New-Rochelle blackberry; and in the ninth, 15 dwarf cherry, and 15 quince bushes. A row of grapes is planted between the first and second rows of trees.

Fig. 15—Arched Gateway.

These rows of dwarfs, &c., are placed one rod apart, giving plenty of space for cultivation between, which spaces are occupied by garden vegetables, and constitute

The Kitchen Garden.

The rows of dwarfs, running north and south, do not shade the plants growing between them, except an hour or two in the morning, and for the same length of time before sunset; and as dwarfs generally have very short and numerous roots, they do not operate as standard fruit trees in withdrawing nourishment from the soil for some distance off.

The strips of land between the rows of dwarfs are a rod wide, but only about ten feet are planted, leaving three feet next the trees on each side. More than half an acre of actual space is thus allotted to the kitchen vegetables,—which, with the exception of a few of the very smallest, are all planted in drills or double drills, and cultivated by horse labor. One strip of soil between two rows, is devoted to *beds*, occupied with radishes,

lettuce, spinach, onions, and other crops of smaller growth; and after this strip is deeply plowed in spring and planted, it is afterwards cultivated exclusively by hand. All the rest, planted with beans, peas, melons, potatoes, beets, parsnips, and even asparagus and strawberries, are cultivated with a horse, and in this way at least four-fifths of the ordinary labor for kitchen gardens is saved; while this rapid means of stirring the soil, keeps it more thoroughly mellowed than could be effected by hand, and as a consequence the crops are larger and better. The cultivator used for this purpose is one which admits of contracting its sides to within one foot of each other, fitting it for narrow drills. This mode of cultivating is especially adapted to farmers' grounds, and not to small village gardens, where horse-labor cannot be so well applied, and is not easily obtained. It has another two-fold advantage;—in manuring for vegetables, the dwarf trees get their share, so essential to success; and in cultivating the vegetables, the trees are not likely to be neglected.

The Fruit Garden

Lies immediately back of the vegetable garden and farm buildings. It is occupied with two rows of plums, 18 trees, (beginning on the west side, and running north and south,) one row of apricots and nectarines, 9 trees; three of early standard pears, 27 trees; two of cherries, 18 trees; four of peaches, 36 trees; and three of early and autumn apples, 27 trees; the latter not only for table use, but to supply the large quantities which are consumed for stewing and baking. Pigs and poultry are allowed to run freely in this fruit garden during the season of the setting and growth of the fruit; and when these are insufficient to destroy all the fallen and wormy fruit, special attention is given to the two rows of plums and one of nectarines and apricots, by running a temporary or hurdle fence at the place indicated by the dotted line, so that enough of these animals may be placed in the smaller enclosure to destroy all the curculios that drop in the punctured fruit.

More room is given in the fruit garden to the apple than to other trees, by placing the rows wider apart, without disarranging the rows in both directions, or preventing the free cultivation of these trees by horse labor—so essential to their healthy growth, and to the quality of the fruit.

A large orchard of winter apples grows on a more remote part of the farm.

The fruit garden, and the dwarf and vegetable garden, are both surrounded with an excellent Osage Orange hedge, which no fruit-stealer can pass. By keeping the soil deep, dry by draining, and well mellowed by cultivation, a good barrier was formed in four years. The usual error of not *cutting down* was carefully avoided in training this hedge. A good beginning was made at the commencement, by shearing off the first year's growth (*a*) within three inches of the ground—(fig. 16, a side view.) The thick mass of vigorous shoots springing up from this shearing, was

Fig. 16—Shearing Down Young Hedges.

Fig. 17—Properly Trimmed Hedge—(end view.)

Fig. 18 — Badly Trimmed Hedge. (end view.)

cut again four inches higher about midsummer, and similar and successive cuttings, each a little longer, in the two following years, brought the hedge up to its full height. The form adopted in shearing is shown by the cross-section in fig. 17, the upper part terminating in a sharp ridge, and growing wider towards the bottom. In this way the lower part preserves its growth, vigor, and denseness, and is not thinned by the shading of the broad top, so commonly seen, and exhibited in fig. 18. A

Fig. 19—Neglected Hedge, (side view.)

neighbor, who made a good beginning with a hedge of the Osage Orange, could not be persuaded to cut off "the fine growth" after the first season, as represented in fig. 16: his hedge consequently never thickened at the bottom, and now presents the appearance shown in the side view—fig. 19.

Out-Buildings.

Immediately behind the dwelling, and fifteen feet from it, is the building containing the wood-house, dairy and ice-house. The inconvenience of a separate wood-house, is balanced by the advantage of exclusion from the noise of cutting and sawing, which would be more annoying in immediate contact with a small house. The dairy, although fronting the south, is kept cool by several dense evergreen trees on its south-west corner, and by the ice-house in its rear.

The privy, P, is flanked by evergreen trees, and the passage to it is lined on both sides by Norway firs, which meet over head, and are kept sheared next to the path which it covers, thus forming at all times a sheltered green avenue.

The smoke-house, *s*, (fig. 20,) is behind the ice-house. It is built of brick, with a stone basement for ash-pit, the latter being about four feet high, plastered smoothly with water-lime inside, and with a loose plank-covering or floor, partly separating the ash-pit from the smoke-house

Fig. 20—Smoke-House and Ashery.

above, and through which the ashes may be poured down. For smoking the meat, a fire is built on this ashes, where it may be perfectly controlled, and the smoke rises above. A ventilator surmounts the building, which is closed or opened at pleasure, to prevent the dampness so common otherwise with brick smoke-houses, on the one hand; as well as a too free escape of smoke on the other. West of the smoke-house is the circular revolving clothes-line frame.

The range of Farm Buildings, is nearly explained by the annexed enlarged plan, fig. 21. The nearest corner is occupied by the piggery, for convenience in emptying swill from the dairy and kitchen. A plan of this building is shown in fig. 22, where the larger feeding pen and lodging room, on the right, are occupied by the larger animals; those of medium size on the left, and the smaller ones by the central pen. An end or east view of this building is shown in fig. 23, exhibiting the large ventilator to preserve pure air, behind the cooking-room chimney. Great pains are taken to keep all the pens dry, clean, and suitably littered.

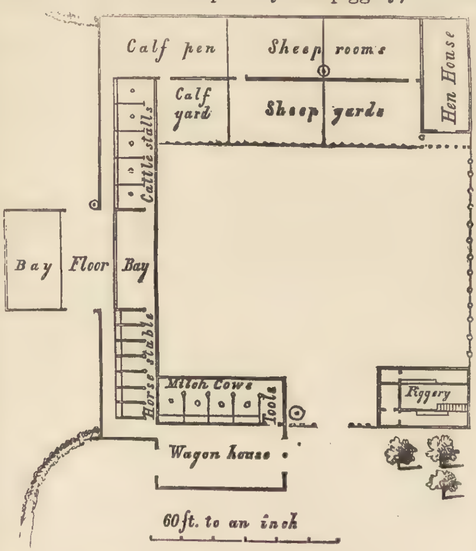


Fig. 21—Range of Farm Buildings.

The wagon-house, next on the left, is forty feet long, so as to afford

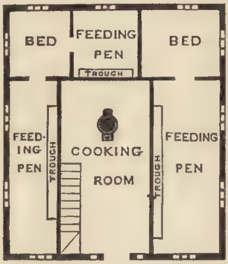


Fig. 22—Plan of Piggery.

ample shelter to wagons, carriages, and other vehicles, which may be driven through, and out at the opposite door. A short alley, under the same cover, allows the horses as soon as they are taken off the wagon, to be led directly to the stable, without passing out of doors. A lean-to is built on the north side of the wagon-house, occupied by a tool-house opening to it, and apartments for eight milch cows, which are kept thus near and convenient for milking in winter. The mangers of this cow-stable are filled from the hay-loft over the wagon-house, by simply thrusting it down an opening directly over them.

The barn itself is 30 by 45 feet, and is built on the usual plan, with a floor in the center, and bays on each side; a portion of the inner bay is reserved for straw, which is kept dry and clean, for both litter and chopping into cattle feed. The threshing is mostly done in winter, by means of a small thresher driven by an endless chain horse power; and usually only half a day's threshing is done at a time, as freshly threshed straw is better liked by cattle than if old and in large heaps. This horse power, placed on the barn floor, is also used for cutting or chopping hay and straw for cattle and horses; and when removed to the wood-house in summer and autumn, is employed for driving the dairy churn, the grindstone, and for sawing wood for winter and summer use.

Fig. 23—End View of Piggery.

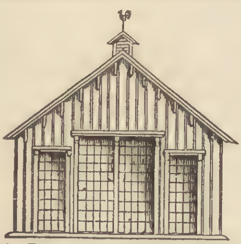
It will be observed that teams may enter the barn and pass out on the opposite side, from the farm road, with but a slight variation from its direct course.

The range of horse stables on the nearer side of the barn, and of the cattle stables on the other side, may be entered, or supplied with grain or other food, by a covered passage from the barn floor. The calf and sheep pens explain themselves—an open yard being attached to each. All this

range of buildings for stables and shelter (except the wagon-house and barn,) are about of equal height, and have ample hay-lofts over them, from which the hay is thrown down into the racks and mangers, through openings, with great facility. They form a hollow square, enclosing the barn-yard,—which is thus sheltered well from south, west, and north winds; and all the water of the roofs is kept from washing the manure, by means of eave troughs passing into three ample cisterns, (shown by the circles) from which horses, cattle, and sheep are readily watered by means of chain pumps. These cisterns are several times larger than cisterns commonly made for the purpose, and from the extent of roof which supplies them, afford at all times an ample supply of water for domestic animals, although a good well has been dug near at hand for such animals as are not accustomed to drink rain water.

All the stables are kept in the neatest order, and when in use are always cleaned at least twice a day.

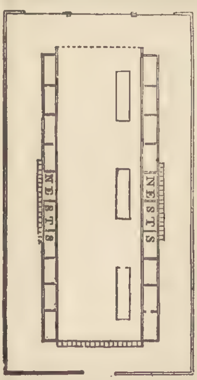
The *hen-house* is the last building in the further range, an enlarged plan and elevation of which is here given. Fig. 24 is the elevation or view of



24—End View of Hen House.

Fig. 25—Vertical Section.

the south end, and the house is amply and almost wholly lighted at this end, by four large windows, one of which also serves as the entrance door — a strong light, from the warm side being especially necessary and useful to a hen-house. Fig. 25 is a vertical cross section—the middle enclosed portion being the "common room," with feeding boxes, trough for water, and a large box of sand for the hens to play in. This room is covered by a *board roof*, two and a half feet below the outer roof, and over this board roof, seen endwise, are the roosting poles. The droppings from these poles fall upon the board roof, and roll down it till they come to the trough at its lower edges, where they are retained, and from which they are easily scraped or swept into a basket and carried to the compost heap. The board walls on each side of the common room, form secluded passages behind them, where two tiers of boxes for nests run their whole length, as shown in the plan, fig. 26. From this



26—Plan of Hen House.

hen house, the inmates are at any time readily let loose into the fruit garden behind it, the latter at most seasons of the year forming the poultry-yard. The poultry-house is provided with a copious ventilator, which may be opened or closed at any time by a rod extending down within reach—free ventilation being of great importance to preserve the comfort and health of fowls, and without which the roosts would become excessively hot in summer nights.

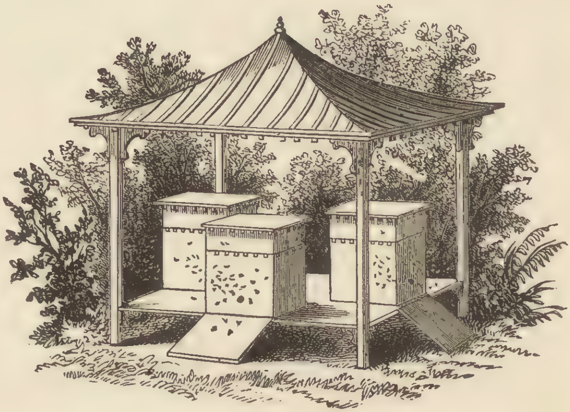
Among some of the luxuries which this place affords, are the following: By means of a hot-bed, the earliest vegetables are obtained almost as soon as ordinary growth commences, and a constant succession in large variety is kept up till winter, after which a supply is still maintained of the winter varieties, such as winter squashes and winter radishes, celery, cauliflower, beets, parsnips, and other roots. The circle of fruits commences with the Early Scarlet and Burr's Pine strawberries, and the early cherries; which are followed by other varieties of the same kinds, continuing the supply till a month or two later. These are immediately followed by raspberries, the new blackberries, early pears, apples, and apricots, and soon after by the earliest plums and peaches. During the whole of autumn, there is a profusion of the different sorts; and winter apples and winter pears usually last till early strawberries the following summer, through the assistance of an excellent cellar. Grapes are kept in the best condition through most of the winter, packed in boxes and jars. Honey from the bees, eggs and fresh poultry from the poultry-house, the richest milk, cream and butter from the dairy, are not omitted in their place.

Rules for Exterior Designs for Houses.

1. In all cases study beauty of form and proportion, and not ornament. Tasteful simplicity is better than fanciful complexity—as a statue in simple drapery is better than one bedizzened with feathers, ribbons, and unmeaning gewgaws.

2. Proportion may be shown in the smallest cottage as well as in the most magnificent palace—and the former should be carefully designed as well as the latter. However small a building may be, let it never show an awkward conception, when a good form is more easily made than a bad one.

3. The general outline of a building should not only exhibit good proportion, but every part. The height of a room, of a door, a window, should accord with its breadth; and the distance and distribution of these should observe the same rule, and should correspond with the expression as a whole.



THE APIARY.

EVERY prosperous swarm of bees must contain one queen and several thousand workers, and part of the year a few thousand drones.

The queen (fig. 28) is the mother of the entire family; her duty appears to be only to deposit eggs in the cells. She is longer than either the

Fig. 28—QUEEN.

Fig. 29—WORKER.

Fig. 30—DRONE.

drones or workers, but her size in other respects, is a medium between the two; in color, darker on the upper side, and her legs and under side somewhat yellowish.

All labor devolves on the workers—(fig. 29.) They range the fields for honey and pollen, secrete wax, construct combs, nurse the young, &c.

The drones (fig. 30) are large and clumsy, and of the least value. They are reared by strong swarms when honey is abundant, and destroyed soon after its failure.

In spring and first of summer, brood is reared more extensively than at any other period. The hive soon becomes crowded with bees, when they commence queens' cells (fig. 31, *a*, *b*,) preparatory for swarming. When

Fig. 31—The Three Kinds of Cells.

one or more of them are advanced sufficiently to be sealed over, (*c*,) the old queen with the first swarm leaves. The young queen matures in eight or ten days, and leaves the cell, (*d*,) and if bees and honey are sufficiently abundant, she leads off a second swarm. In a day or two after, the third often follows. When it is decided that no more are to issue, whether one or three have left, all supernumerary queens are destroyed; such as are in the cells are removed prematurely, leaving it like *e* in fig. 31.

Practical Rules.

Each good early swarm of bees in ordinary seasons, will store more than is needed for their own consumption in winter. This surplus, with proper arrangements, may be taken from them without detriment to their future prosperity. This principle lies at the foundation of all profit in modern Bee culture.

If this surplus is designed for market, the hive should be arranged for glass boxes. If for home consumption, the simple box hive with holes through the top, and a simple rough box to hold 25 or 30 pounds set over, is all sufficient—the honey will be of the same quality. Yet the honey stored in glass boxes presents its qualities through the glass so temptingly, that it will sell in market at higher prices than the other; and the boxes, if lightly made at the same rate, which pays the extra expense for them.

THE SIZE OF THE HIVE,

For all sections north of 40 degrees, should be 2,000 cubic inches—south of that about 1,800. The winters are longer in a high latitude and require more stores for winter,—a large hive will secure it,—but in any section there must be room for brood combs, and not much less than 1,800 will do.

The cheapest material for hives is sound inch boards, unplaned except at the corners to make close joints. A suitable shape, is 12 inches square inside, and 14 high—sticks are needed across the center inside each way, to help support the combs, and a hole for the bees to pass in the front side, one-third the way up. The top should be 15 inches square, and project a half inch over each side the hive. Plane only the upper side; rabbet out the corner an inch wide and half inch deep, upon which a box or

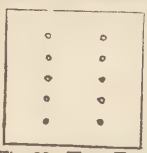


Fig. 32—HIVE TOP.

cap 13 inches square inside, will exactly fit. This cap is for cover to glass boxes, and should be seven inches deep, and may be made of half-inch boards. Through the top of the hive (fig. 32) make two rows of inch holes, about three inches each side of a line drawn through the center. They should be uniformly distant to match others in the bottom of glass boxes that are to fit over them. This is now ready to be nailed on the hive—stop the holes and set it away for use.

Two glass boxes, 12¼ inches long by 6¼ wide, (fig. 33,) are to go on the hive at once, or four, 6¼ square, may be used. For the wood part of

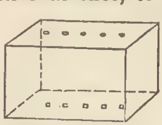


Fig. 33—GLASS BOX, bottom up, showing the holes in the bottom and combs in the top.

these, (top and bottom,) thin boards are planed to one-fourth inch thickness, and cut to the proper length and width; through the bottom make holes to correspond with those in the top of the hive. The posts for the corners are five-eighths inch square, and five inches long. In two adjacent sides of each, make a narrow groove with a saw or other tool, one-fourth inch deep for the glass to fit in. Set up the box by nailing through each corner into the posts. Smaller posts may be used and the glass held by pieces of tin if preferred. Pieces of new white comb an inch square, are fastened to the top two inches apart—it is done by dipping one edge in melted beeswax and applied before cooling. Glass are cut the right size from panes 10 by 12, with little

waste, and slipped into the channels, and the other part nailed on; it is ready for use, when the condition of the stock or swarm requires it.

The stand is made of inch boards 15 inches wide by two feet long, the ends nailed on pieces of wood or joist from two to four inches square, and put directly on the ground, with the hive on the back end. The advantages will balance any little trouble of keeping down grass, weeds, &c. The roof is made by nailing together two boards like a house roof, 18 by 24 inches, and laid on loosely. This can be drawn over to protect the hive (fig. 34) from the sun in hot weather, and put back to allow the direct rays of the sun to strike it in spring or other time when only moderate.

Fig. 34—Hive Roof and Stand.

Those who cultivate bees for *profit* alone, will dispense with all ornament, and take only the necessary measures just described to secure it. But to have the apiary correspond with other fixtures of an establishment, ornaments (fig. 35) may be added to this hive without detriment, if the principle is preserved.

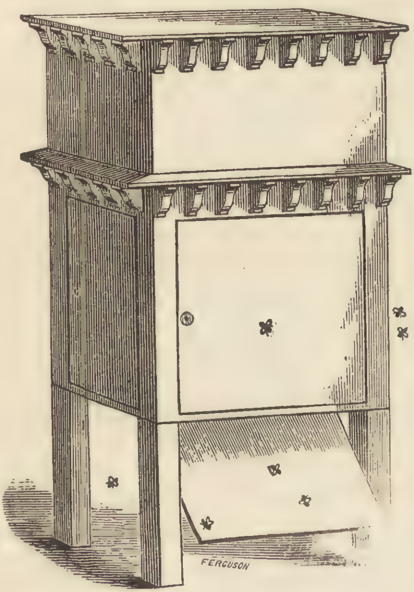


Fig. 35—Ornamental Hive.

In painting hives, &c., light colors are preferable.

The apiary should be protected from winds by a high board fence or buildings. When not limited for room, stands should be placed four feet apart.

Whenever the bees of old stocks are crowded outside of the hive, when *that* is raised half an inch for ventilation, it is time the boxes were added, if in a season of honey. New swarms should receive the boxes a little before the hive is full, unless the honey season is too nearly over. Full boxes should be exchanged for empty ones as fast as filled.

Bees in this latitude commence swarming (fig. 36) some seasons the last of May, and cease the 10th of July; in others they commence as late as the 20th of June, or even later, and get through about 25th July, and occasionally a buckwheat swarm in August. First swarms seldom issue earlier in the day than nine o'clock, or later than three. Second or after swarms sometimes as early as seven, and as late as five. All swarms should be hived soon after clustering. It is not very important what process is adopted; when convenient, they are readily dislodged and caught in the hive, and that set upon a board on which are small sticks to raise it an inch. Sometimes a portion will remain on the outside of the hive—these may be made to enter by gentle disturbance with the feather end of a quill, or a slight sprinkling with water. When they have entered they may be carried at once to the stand,—the front side to be raised half an inch, and the whole hive effectually protected from the sun. First swarms are usually large enough for one colony, and when practicable should be kept separate. Second swarms are generally half as large as the first, and when near one time, two may be united. Third swarms are still less, and should have their queens taken away from them and returned to the parent stock, or several such united. This secures strong colonies, which will repel any attack from the moth more effectually than small ones. The principal secret of success against this enemy is in this point—*strong colonies.*

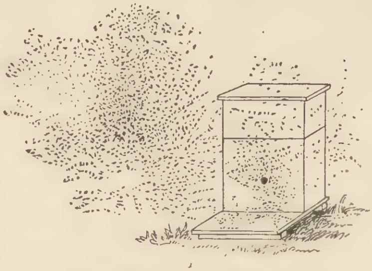


Fig. 36—Swarm Issuing.

In the fall as soon as honey fails in the flowers, every stock and swarm should be examined, and *all*, not strong enough to defend their stores from robbers on the start, should be at once removed—they *cannot* be wintered, and leaving them longer will only give rise to vexation and loss—it is better and much easier to prevent an evil here than to cure it afterwards. In the spring weak stocks with proper care may recover and be worth something. The apiarian should know which they are, and close the entrance, allowing only one bee to pass at once. This will give a weak family that has energy, a chance to repel all strangers.

None but strong healthy stocks should be selected for winter. If left out-doors, a free admission of air must be secured; at the same time the mice must be kept out. Wire cloth is a good article for the purpose, cut into suitable pieces and fastened with small tacks over the entrance in such a way that the bees may pass, but not the mice. It is safer to have them in the sun, than wholly shaded during long terms of cold weather.

Where a large number are to be wintered, a warm dark room or dry cellar of suitable size to hold them conveniently, is probably the safest place. At the beginning of severe weather they are to be housed. To prevent the combs from moulding, the hive should be turned bottom up and the holes in the top opened. Small blocks of wood an inch square, are first put down to hold the hive. One row is put down on the bottom on one side of the room; a shelf a few inches above receives another row, and now still another above, when another commencement is made at the bottom, and continued in this way till the room is full. The shelves should be loose and put in as needed; and taken out as the bees are removed. They will then not be in the way in placing the hives, as sudden jars are to be avoided. The first fine days of March or April, they can be set out. The snow is no objection, if it is only a little hard; about a dozen only should be taken out at once. In an hour or two, most of the bees will have been out and returned, when as many more may be set out; choose the warmest part of the day, and if practicable each hive should occupy its old stand.

For the sake of brevity, many of the reasons that have dictated these rules are not given. Many important points are unnoticed, others only glanced at; they are valuable to some extent, and the reader who wishes to realize the most profit from his bees with the least trouble and expense, will find the hive here recommended valuable. M. QUINBY, *author of "The Mysteries of Bee-Keeping Explained."*

COUNTRY HOUSES.

No greater drawback to the comforts and attractions of country life exists, than in the drudgery and discomforts to which farmers' wives and daughters are subjected in boarding and lodging large numbers of *hired men.* Laborers' and mechanics' wives have a comparatively easy life, having but small families to provide for; but the wife of the large farmer, who must supply hearty meals for fifteen or twenty persons, at least three times a day, passes a life of hopeless drudgery. No wonder then, that we so frequently see them broken down with premature old age, while the mechanics' and merchants' wives are straight, blooming, vigorous and active. No wonder, that farmers' sons turn away from such scenes of discomfort, to the "learned professions," and that young women generally, but especially town ladies, look upon it as a sort of state-prison-punishment to be compelled to marry a young farmer, especially if he cultivates many hundred acres.

Nothing would sooner render agriculture respectable, honorable, pleasant and attractive to young people, and profitable to all, than the practice

of erecting good laborers' cottages, (such as industrious and respectable laborers would like to occupy,) so that farm hands may board themselves, and the owner's family may enjoy the quiet and exclusion to which they are as fairly entitled as other men's families. The writer speaks from long and ample experience in saying, that by thus employing married men chiefly, better hands may be had, and at less total cost, than by any other way.

It is for these reasons especially, that plans of LABORERS' COTTAGES merit a full share of attention among those of Country Houses generally.

Fig. 37—LABORER'S COTTAGE.

The design here represented, is one of Downing's. It is simple, cheap, and substantial. The mode of building is distinctly shown in the view; the battened vertical boarding being as cheap as thin horizontal clapboards, more durable, and stronger—on the whole better adapted to buildings of this character. A considerable amount of expense is saved by using *rough* boards, which are rendered equally ornamental with planed boards by a coating of light brown oil paint. It is proper to remark, that the window-hoods should be made of plank at least two inches thick.

An improvement of the plan (fig. 38) may be made by placing a door so that the bed-room shall open directly into the living-room, and by en-

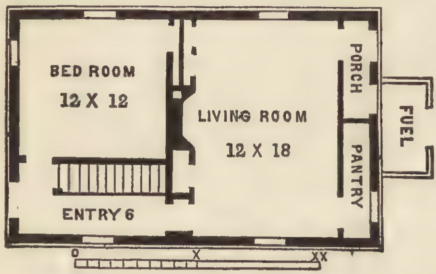


Fig. 38—Plan of Laborer's Cottage.

larging the wood-room in the rear. The cellar stairs are under the entry stairs, so that ready access is obtained to the cellar from the living-room; while an out-door entrance is placed under the pantry window. There are two comfortable rooms above.

The cost of this cottage well built, with brick filling and with cellar under the whole, is about three hundred to three hundred and fifty dollars. Without the cellar, it would be sixty or seventy dollars less. It may be built in a cheaper manner, without brick filling, and of poorer lumber, for two hundred, omitting the cellar.

Fig. 39—Laborer's Cottage.

This cottage was built of small frame timber, the two wings firmly bracing the central portion, four inch scantling being found quite large enough for this purpose. The plank siding formed the only connection in the frame between the plates and sills—lessening the cost. The exterior is rough, and is occasionally whitewashed—obviating the

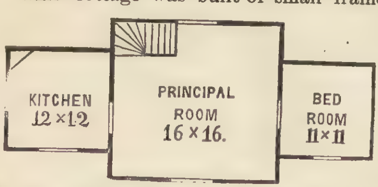


Fig. 40—Plan of Laborer's Cottage.

expense of painting the large exterior surface. The actual cost of this cottage, built when lumber was cheap, was less than two hundred dollars.

The plan (fig. 40) will show the internal arrangement. A cellar is situated under the kitchen; and a spacious chamber over the principal room, may be divided into two small bedrooms. The kitchen ceiling is lathed on the rafters,—the chimney is built on the floor of the chamber in the principal part, so that the pipe from the cook stove passes horizontally into it. The pipe from the stove in the principal room, passes through the floor above into the same chimney. The floors for the kitchen and chamber are made of rough boards.

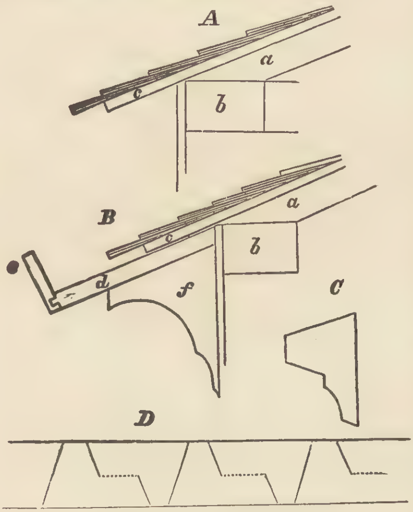


Fig. 41—Eave Troughs.

The mode of constructing the eave troughs is shown in fig. 41, and they are found cheap and good. *A* represents the eaves simply, *a* being the lower end of the rafter, resting on the plate *b*, supporting the edge of the roof-board *c*, which projects about eight inches. *B* exhibits the same with the eave-trough attached; which is done by placing a sound and durable inch-and-a-half plank, *d*, directly under the roof-board, and projecting several inches beyond it, supported by the brackets, *f*. The strip *e*, is added by matching, forming the trough. A coat of good paint completes it. A lining of tin-plate, or zinc, would be more substantial. *D*, shows the mode in which the two-inch plank, for brackets, is cut up without waste. The cross lines are for the saw, the dotted lines where the wood is separated by splitting. *C*, is a finished bracket.

A Swiss Suburban Cottage.

The Swiss cottage, as commonly built, is hardly adapted to the purposes of a residence in this country. Its picturesqueness may be retained, however, without copying its defects. The view here presented, (fig. 42,) has the boldness of the Swiss style much subdued, and is accompanied with more neatness of expression than is commonly found in this style. It exhibits a cottage, built on the grounds of E. P. Prentice, Esq., of Albany, and

Fig. 42—Swiss Suburban Cottage.

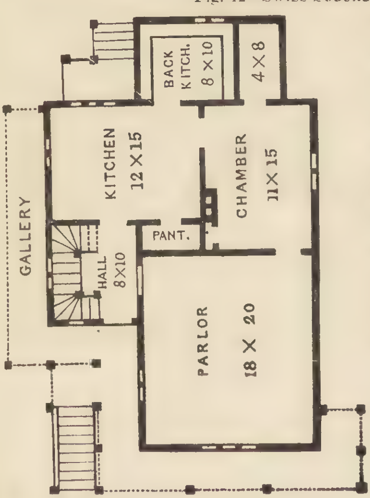


Fig. 43—Plan of Swiss Cottage.

accords well with the hillside scenery where it stands.

The plan (fig. 43) shows that this was not intended for an ordinary farm house, but for a small suburban residence for a person doing business in the adjacent city. The second story has three bed-rooms. A cellar extends under the whole.

The external covering is shingles, cut to an ornamental pattern; the frame being first covered with rough boarding, on which is laid tar-paper, before the shingles were applied. Shingles form quite a durable outside, and the whole taken together makes a warm and dry house. It is well painted of a light drab color.

Fig. 44—Stone Cottage.

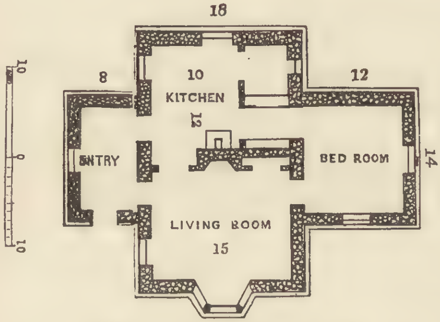


Fig. 45—Plan of Stone Cottage.

This is a neat cottage, for a small farm-house, or for the better class of laborers' dwellings. It may be built of cobble stone or block stone for about four hundred dollars. The entry may be converted to an additional bed-room, by opening an entrance-door into the living-room at the side, next this wing.

Fig. 46—A Small Farm House.

A correspondent has furnished the accompanying plan (fig. 47) of an improvement of the design on page 28 of the Register for 1855, the al-

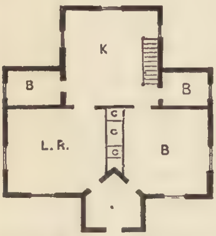


Fig. 47—Plan of Farm House.

terations giving the two principal rooms a square instead of an octagonal form, by placing the closets between them instead of at the corners. The two small bed-rooms which flank the kitchen, afford important additional room at little increased cost. The perspective view of this house is repeated in order that the whole may be seen together.

Six or seven hundred dollars would build this dwelling, in a good and plain style, with the larger rooms 15 by 16 feet, and 8½ feet high.

Fig. 48—A Plain House in the Cottage Gothic Style.

The accompanying design was furnished by a correspondent, with a request for the suggestion of improvements. The most obvious defect is the direct passing from without through single doors, into the parlor and library. This objectionable feature may be removed by converting the central portion of the veranda into an entry or vestibule, opening into these two apartments. It will constitute a good farm-house, and if built in a cheap substantial manner, with the lower apartments nine feet high, will cost about fifteen hundred dollars. The following is the description of the plan furnished by our correspondent:

Enclosed is the plan (figs. 49, 50) of a country house, lately drawn for a friend who is about to build, and who wants a house with four rooms and a kitchen on the first floor, and one story high.

A house built on this plan, would be both comfortable and convenient, and at the same time, as ornamental as a farmer who did not wish to be thought "freakish," would like to build in western Pennsylvania, where you will frequently see *fire walls*, or perhaps a roof extending over the gable just far enough to cover a three-quarter inch

"barge board," high grecian porticos, and chimneys invariably in the outside walls.

The main building will be 32 by 34 feet; the kitchen 12 by 16, with two porches 4 feet wide—the pantry and coal-house connected with the kitchen, will be 8 by 20 feet. There is a door opening out of the kitchen into the pantry, and from the porch into the coal-house.

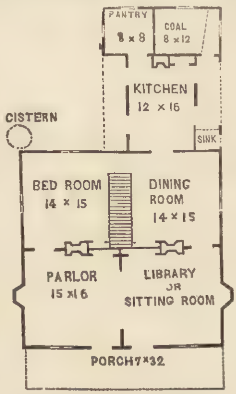


Fig. 49—First Floor.

The building will front the south-east, and from the bay window in the sitting-room, will be visible three-fourths of the farm; from the parlor bay will be seen part of the orchard and the shrubbery.

Each room is provided with one closet or wardrobe; the library with a permanent book-case. All the windows in the second story open on hinges; the one to the north-east into a small balcony with light iron railing, 4 by 6 feet, which is sheltered by the roof, projecting over the wall two feet. The window at the opposite end has a railing attached to the outer edge of the wall, three feet high. The lower story, besides the dining-room, library, and parlor, contains one large bed-room. The second has two good bed-rooms, 12 by 16 feet, and if necessary, a bed could be placed in the middle room, which is 8 by 16 feet, extending to the front wall. The stories are each 10 feet high. The stairs ascend between the chamber and dining-room; the cellar stairs are under them. Every room except the middle one in the second story, is provided with a fire-place. The roof is steep, the apex being 16 feet from the second floor; this leaves room for a high ceiling in the upper bed-rooms, and for a small ventilating window at each end, above the ceiling, which permits a free circulation of air between the plastering and roof.

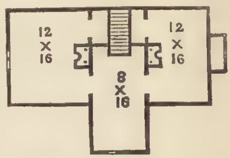


Fig. 50—Second Floor.

A Cheap Farm House.

This plan (figs. 51, 52, 53) was furnished by a western correspondent, and is intended to combine as many of the common, every-day conveniences of a farmers' dwelling, in a well-arranged and compact form, as can be afforded for a given sum. The absence of a parlor will strike some eyes as an obvious deficiency; but for a farmer of moderate means, the less that is kept for show and the more for comfort and convenience, the better. A neighbor, who is a farmer of good means and superior intelligence, has reserved one room as a parlor—but it has been kept shut up as dead property, and to our certain knowledge, has been used but twice

Fig. 51—A Cheap Farm House.

in fifteen years,—once for a quilting party, and once for a wedding. The owner, to have more room, added in the first place a kitchen to his main building, so as to have a dining or living room, and "save" his parlor;

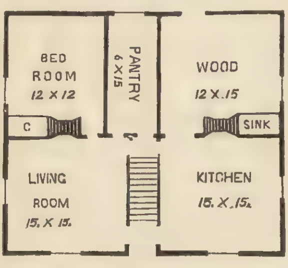


Fig. 52—Ground Plan—30 by 33 feet.

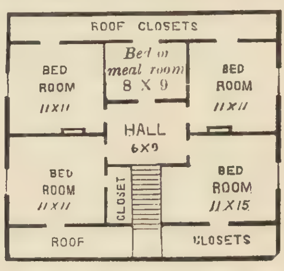


Fig. 53—Second Floor.

next, the kitchen was converted into a dining-room, and the wood-house was lathed and plastered for a kitchen; and several successive additions have been since made—the parlor remaining in solitary loneliness. Now, if this room, *kept for show, but never made visible*, with its furniture, cost $500, then its use once in seven years must cost, with interest, decay, &c., about *four hundred dollars* for each occasion. At the same time there are some serious domestic inconveniences that might be remedied for a fourth part that sum, and some glaring exceptions to neatness outside, which a tenth part would remove.

These remarks are intended to apply only to *cheap* houses, where a limited expenditure of means should be applied first to procure such ac-

commodations as are in constant use, if convenience and show cannot be had at the same time.

The plans exhibit the whole arrangement. The wood-room is devoted to the storage of wood, after it has been cut ready for stove use. It will be observed that the wood-room, pantry, kitchen, and living-room, although sufficiently separated, are in near and convenient proximity, and that common household labors will be far more easily performed in such a house as this, than in some large establishments, where comparatively long journeys must be performed to pass from one apartment to another.

It is intended that the cistern pump discharge into the sink, and that the well be equally near at hand.

The cost of this house, with a variation in the cost of materials, and in finish, will be from nine to twelve hundred dollars.

Fig. 54—Bracketed Farm House.

A comfortable, spacious, and symmetrical farm house, is represented in the view and plans here presented, the exterior of which originally appeared in one of Downing's books. It is one of the best of his many designs. The plan is mainly copied from Loudon. As it is a simple parallelogram, it may be cheaply built, and with little waste of material. The roof has no receding angles, and is therefore free from danger of leakages.

The entrance hall (fig. 55) opens to the parlor, living-room, and through

the back transverse passage to all the kitchen apartments, except the scullery, which may be a wash-room or back kitchen, and which is entered through the back door. Exactly opposite this back door, and in the inner partition of the scullery, a window should be placed for lighting the passage from the kitchen to the dairy. Those who prefer having the dairy in a separate building, may convert this apartment into a bed-room. In this case, the pantry may be converted into a milk-room, and a pantry taken off the scullery. The position of these kitchen appendages is such as to afford unusual facilities for any modifications of this sort.

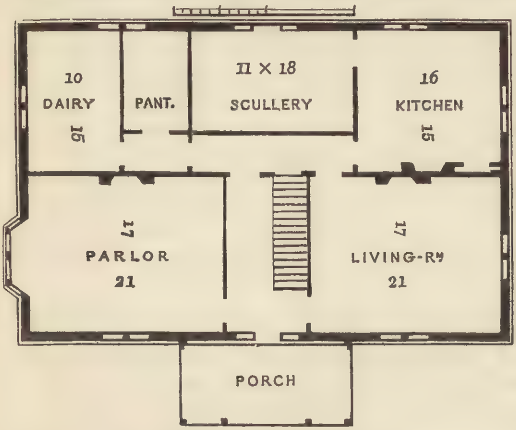


Fig. 55—Plan of Principal Floor.

The second story (fig. 56) is divided into six bed-rooms of ample size, all of which are entered from the upper hall and passage. The steepness of the roof is sufficient to afford an ample garret, for the various purposes required by the farmer. If necessary, three or four bed-rooms for workmen may be finished off from it.

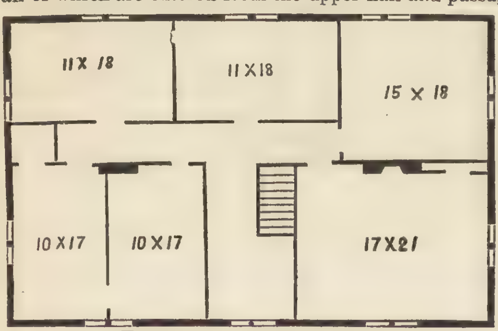


Fig. 56—Plan of Second Floor.

This house, built in the vertical boarding style as represented in the view, or with common horizontal clapboarding, which will cost the same, might be finished in a good substantial manner, filled in with brick, for $1800 to $2000.

Fig. 57—Italian Farm House.

This design is intended to exhibit a dwelling expressive of an air of modest and refined neatness, free from any bold or prominent peculiarity of architecture. Its general air is that of the Italian style, presenting the varied outline and freedom from stiffness for which this mode of building is distinguished, but without a rigid adherence to architectural rules. It is intended for an intellectual family in moderate or comfortable circumstances, and either as a farm or suburban residence. Without any attempt at costly ornament, it aims to give a tasteful exterior. A profusion of decoration, or as commonly termed, "gingerbread work," is one of the most common faults in our newer country dwellings, much oftener showing a want of architectural taste than its presence.

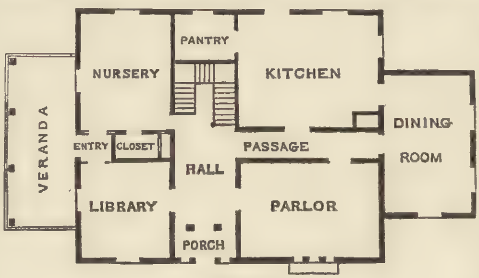


Fig. 58.

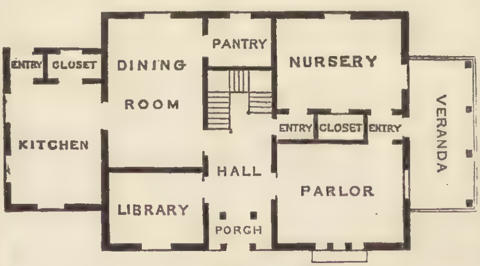


Fig. 59.

The simple elegance of a statue, with the plainest drapery, is infinitely more pleasing than if bedizzened with flashy ornaments, ribbons, poppies, and peacock feathers; and more taste may be shown in the form and proportions of a log dwelling, than Horace Walpole exhibited by his splendid erection at Strawberry Hill, which was in fact only a glittering jumble.

The plan (fig. 58) needs but little explanation. The library may be devoted to books, papers, objects of natural history, optical instruments, &c., and would form an interesting resort for the younger members of the family, or for the pursuit of their home studies; or it might be occupied as a business office. We have given modifications of the plan in the accompanying figures. In fig. 58, the nursery and library both open (through a small entry, so as to exclude the direct cold air of winter,) upon the veranda, that the children and young people may enjoy its full benefit. The dining-room, entered through the side passage, is freely accessible from both kitchen and parlor, and may be used as a snug, retired and comfortable living-room. For those who prefer a parlor opening on the veranda, the second plan (fig. 59) is given, the dining-room and veranda of fig. 58 being made to change places with each other, so that the nursery and parlor both open by means of an entry, upon the veranda—this mode of access through an entry being more secure from cold, and better adapted to a house of this character than windows opening as doors. If desired, the veranda may be replaced with two bed-rooms, for a larger or increasing family—a very common circumstance.

The plan of the second floor is not given, as it very nearly resembles, in its general form, the plan below. It may be made into six bed-rooms, by dividing the space over the kitchen in the first plan, and over the dining-room in the second, leaving the necessary passages for this purpose. Those who lodge hired men may prefer a separate stairway to the two back rooms, in which case narrow stairs may be placed at one side of the kitchen, directly under which the cellar-stairway may descend. The dairy occupies a separate room in the cellar, with a free access to pure fresh air. The roof over the hall only rises to the eaves of the side wall, thus avoiding the usual leakages of re-entering angles in roofs. As it is, however, more nearly horizontal than the rest, it should be covered with a metalic coating of the same color as the rest of the roof.

This house, built on a moderate scale, or with the four larger rooms about 15 by 17 feet, and 10 feet high, perfectly plain in its finish, may be completed for about eighteen hundred dollars. With larger rooms, more massive and durable walls, and higher finish, it might be made to cost three thousand to three thousand five hundred.

Battened Country House.

This is a spacious, convenient, and symmetrical design for a suburban residence or farm house of the better class, and is well adapted to pictu-

Fig. 60—Battened Country House.

resque scenery. The plan (fig. 61) is original; the view was designed some years ago by **R. V. De Witt, of Albany.**

The entrance hall opens separately into the living-room, nursery, parlor, and library. The pantry, as should always be the case when it combines

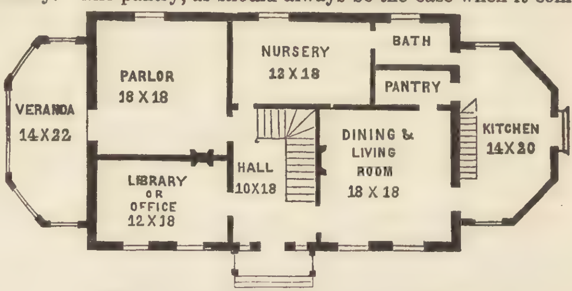


Fig. 61—Plan of Battened Country House.

china-closet and provision room, opens to both kitchen and dining-room —to the latter, by a slide or small door two feet square. The bath-room, being accessible to both nursery and kitchen, is in the most convenient position for the former, and may be readily supplied with warm water

from the latter. The small chimney for the kitchen stove, surmounted with one of Mott's ventilators, is omitted in the elevation or view.

By a slight alteration in the partition between the library and parlor, these two rooms may be varied to suit different wants and purposes. A living-room and parlor may be made of these, with folding doors, the chimney being omitted, and warmth imparted by means of a hot-air furnace. Or, the library may be converted to a bed-room; or, the partition may be moved back, so as to give the parlor in front, and leave room for a bed-room back, according to the nature of the exterior view, the best prosport being reserved for the parlor windows. In either case, it opens by a double door on the veranda.

The second floor is subdivided like the first, and may be made to form four or six bed-rooms, according to their size; and any desired amount of space may be devoted to closets, by separating the rooms by means of two partitions three feet apart, and forming two closets of this space, each opening to its appropriate room. A large closet for bedding may be left at the back end of the upper hall. The space over the pantry and bath-room, and over the nursery, is devoted to bed-rooms entered by the kitchen stairs; and beneath these stairs is the entrance to the cellar.

Fig. 62—Ornamental Gate.

The exterior walls of this house are wood, boarded vertically and battened, and rendered warm for winter and cool for summer, by brick filling. A better expression would be imparted by larger chimneys.

The cost of this house would be about $2,200 to $2,500.

An Entrance Gate, adapted to the expression of this house, is shown in fig. 62.

A Gothic Mansion.

This design of G. Wheeler, presents a neat, graceful, and elegant exterior of a mansion in the Tudor Gothic style, suited to the more wealthy class of country residents. It will be observed on comparing the view and plan, that the former is a side view, the entrance being at the right end of the figure, under the angular porch.

The plan (fig. 64) nearly explains itself. There is an unusually large provision for the entertainment of company, more than many will desire, but suited to the wants of others. The rooms, except the library and kitchen, are fourteen feet high, and large in proportion.

Fig. 63—Gothic Mansion.

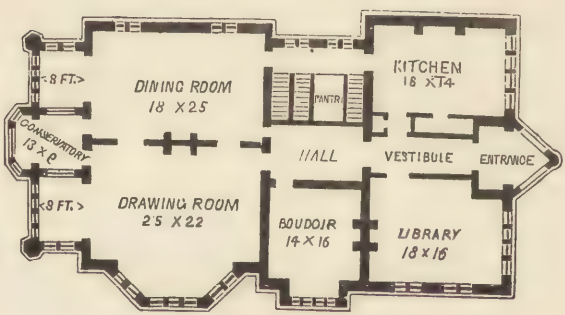


Fig. 64—Plan of Gothic Mansion.

NOTES ON FRUITS.*

CULTURE OF FRUITS—FAMILIAR HINTS.

It is not necessary at the present time, when almost everybody is planting fruit trees, to go into a long argument to show its advantages. A continued and most convincing proof is furnished by the fruit itself,—whether it be from the single loaded plum or apricot tree in the pinched-up kitchen-yard of the townsman,—or the broad orchard bending under the myriads of delicious specimens on the spacious grounds of the farmer.

But an inquiry is made—much oftener than it is rightly answered—"how shall we manage our young trees, from the moment they are received from the nursery, so that they may speedily come into profitable bearing?"—or, "how long will my young trees have to grow before I shall get fruit from them?"

As the time required for their fruiting depends very greatly on their management; while the quality, even more than the amount yielded, is influenced by the treatment they receive, it is well worth some pains and labor to give them every advantage.

Is it not strange, that while every man knows so perfectly well that half-starved cattle cannot possibly thrive, so many expect young fruit

Fig. 65.

trees not only to thrive and grow, but to yield good crops, when not receiving even a tenth part of the attention that is bestowed on a half-neg-

* For directions in relation to the Culture and Management of Fruits, see Register for 1855—for careful and complete Descriptions of the Best Varieties, and an article on the Propagation and Pruning of the Grape, see Register for 1856—for Suggestions on Laying Out and Planting Orchards, and on the Small Fruits, see Register for 1857—while many other notes in connection with the subject will be found in all three of them.

lected herd of cattle? Crowded, in the first place, into small holes, dug into hard soil; and afterwards suffered to be overgrown and choked by weeds and grass, they are quite sure to refuse the injustice of repaying with a good crop such negligence, not to say utter starvation at the roots. It is not difficult to see plenty of just such trees, of the apple, for instance, in passing through some parts of the country, of which the acompanying portraits are tolerably fair representations—(fig. 65.) Now, it is nothing whatever but this neglect that has reduced them to such a condition; with good cultivation they might have been just such healthy, vigorous, handsome, prolific specimens as these below, (fig. 66,) which happily are becoming more and more common every succeeding year.

In reply to the inquiry as to the best treatment for trees—The first thing is to get a good soil. To set good trees on bad land, is like building a house without a foundation, or like sitting down to dine at empty dishes; there is nothing to support the growth of the tree—no food to supply it with proper nourishment. If, therefore, the soil is not already such as to yield a crop of sixty or seventy bushels of Indian corn per acre, it should be made so, if trees are expected to flourish in the finest manner. The first thing is to obtain sufficient *depth* of soil,—to enable the roots to extend themselves freely, and to hold moisture without drying up in protracted drouths. This may be obtained by digging very large holes, say eight feet in diameter, and a foot and a half deep, and filling them with rich earth. But a better way is to plow the whole surface to that depth, and to enrich it well by manuring. A common plow will descend six or seven inches; by passing another plow in the furrow, that is by trench-plowing, the soil may be loosened to ten inches or a foot. But by means of a good subsoil plow in the common furrow, a depth of fifteen to eighteen inches may be attained. Now, to work the manure down to that depth, and make the whole one broad deep bed of the richest soil, it must

Fig. 66.

be first spread on the surface evenly after the whole has been well subsoiled, then harrowed to break it fine and mix it with the top soil, and then thrown down by a thorough trench-plowing. For although the trench-plowing can hardly be worked a foot in depth of itself, yet after a good loosening with the subsoil plow, it may be at once extended down a foot and a half. If this is done in the fall, and another good plowing given in spring, the whole will be in fine condition for the reception of trees. Does this seem like a great deal of cost and labor? It is the very cheapest way of getting fine crops of the best fruit, for the way in which strong, long, and healthy shoots will run up even the first year, will seem like nothing short of magic; and the short time in which such trees will begin to hang out their ruddy or golden treasures, and the size, beauty, and richness of the fruit afforded from such an orchard, kept well cultivated during its early years, will astonish those who have never seen any but slip-shod culture.

After a tree is well set out in such an admirably prepared soil, the subsequent treatment, although of the greatest importance, is very simple. It consists merely in keeping the soil mellow, by repeated stirring, and preventing the growth of any vegetable for several feet from the tree, whether it be weeds or the growth of a crop. A *hoed* crop is however admissible, as being next best to clear mellow ground, because most of the surface is still kept well stirred during the operation of tillage. A *sowed* crop, grass, or weeds, is ruinous to young trees.

These hints, we are aware, are not new to many; but it is often better to repeat an old and important truth, till all practice it, than to search only for what is new.

Sprouts about Fruit Trees.—These often become troublesome and unsightly. It is a common practice to cut them off at the surface of the ground. But this leaves many dead stumps, and the sprouts soon spring up again. The best time is to remove them early in summer, when they will be less likely to grow again; and if they are not too large, they may be pulled off with the hands, assisted by one foot (in a thick boot,) placed between the sprout and tree. If they are too large, or too low down, to be taken off in this way, then the earth must be scraped away so that they may be cut off closely to the tree.

Re-Grafting Old Trees.—The late George Olmsted of Hartford, Ct., was very successful in grafting new tops into old trees. His rule was always to begin at the top and graft one-third of the tree in each year—three years being thus required to complete the entire head. By grafting at the top first, the grafts are not shaded by the remaining branches; while the necessary reduction throws the sap into the remaining side limbs, and gives them vigor for grafting the next year. A tree *seventy-five years old*, was successfully treated in this way. The fourth year afterwards it bore 10 bushels of apples; the fifth year 8, and the sixth $28\frac{1}{2}$.

THE GRAPE.

THE BEST HARDY GRAPES.—This rapidly-growing, quick-bearing, delicious fruit, is every year attracting increased attention. The hardy varieties are especially inquired for. Among these, the following are the best. The *Isabella* and *Catawba*, widely-cultivated and well-known sorts. Neither of them ripen well ordinarily at the extreme north. Unless *fully* ripe they are not themselves. The bunch of a well-ripened Isabella breaks easily from the vine, almost with a touch. The *Diana* is much smaller than either, copper-colored or pink, two weeks earlier than the Isabella, and of a delicate, sweet and excellent flavor. The *Concord* ripens about the same time as the Diana, is large and showy, nearly black, and of a good, but not of the best flavor. The *York Madeira* is much like the Isabella, but less musky and with less pulp, smaller, and a few days earlier. The *Clinton* is two weeks earlier than the Isabella, the bunches and berries are small, the flavor rather acid, but the vines are very hardy, of vigorous growth, and productive. The *Delaware* is a small, brown, and excellent grape, ripens nearly with the Isabella, and is hardy. The *Rebecca* grape (fig. 67) is quite new, but promises high value; its color "white" like that of the Sweetwater, and its flavor very fine; the vine has proved quite hardy. Both the two last have much of the delicacy of the exotic sorts.

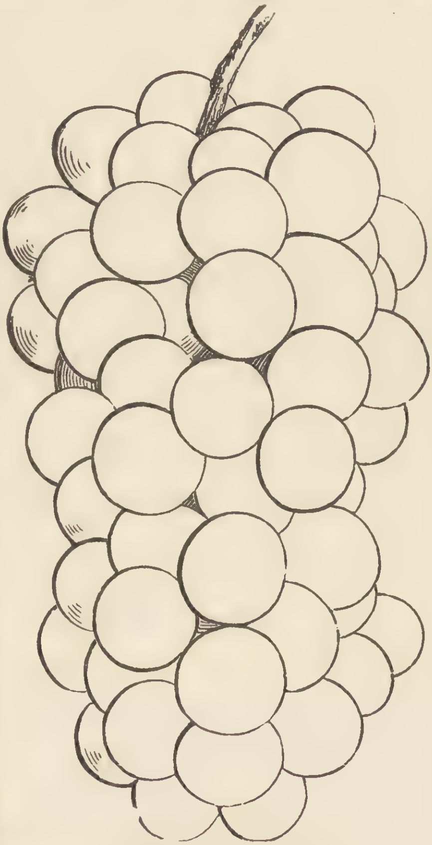


Fig. 67—THE REBECCA GRAPE.

KEEPING GRAPES.—A new method of keeping grapes in winter has been adopted to some extent in France, consisting essentially in hanging up the bunches separately *by the smaller end*, on wire hooks. Small wires, of sufficient stiffness, and a few inches in length, are bent into hooks in the shape of the letter S; one end is passed into the smaller end of the bunch, and the other placed upon a suspended hoop, as shown in fig. 68. The position of the bunches causes every berry *to hang away from its neighbor*, and consequently they are less liable to rot by contact, than by any other arrangement.

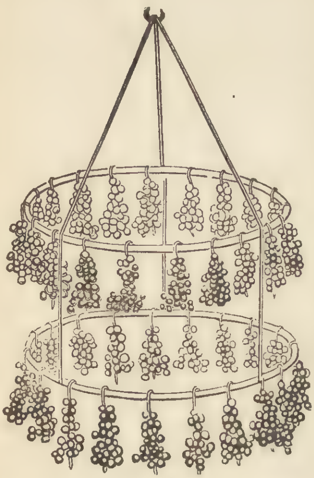


Fig. 68.

The hoops are suspended by three cords or wires to a button overhead, like the hook of a baby-jumper; and any convenient number of hoops may be hung successively under the first. The center of the fruit-room may be thus occupied; and the walls may be covered by passing horizontal wires around the walls, and about a foot from them, to receive the hoops for the suspension of the bunches.

This will be found much more perfect than the more common practice of keeping grapes upon shelves or in drawers. It is hardly requisite to remind those accustomed to the successful keeping of grapes, of the necessity of careful picking, the removal of imperfect or decayed berries, and of avoiding too much moisture in the fruit-room on the one hand, and of such a degree of dryness on the other as to cause wilting. The necessity of excluding frost is of course obvious.

GRAPES AROUND BOSTON.—Some years since the product of exotic grapes, in glass grape-houses, within ten miles of Boston, was estimated at *forty tons* yearly, and of late years great additions have been made.

THE CURRANT.

VARIETIES OF THE CURRANT.—The old red and white currants, if well cultivated and pruned of old wood, so that new wood may constantly spring up and bear, will be five times as large as on neglected old bushes, and are good sorts. The *Red* and *White Dutch*, generally regarded the best on the whole, are much like these old ones, except that the bunches are much longer. The *Cherry* currant (fig. 69) is the largest red currant, about half an inch in diameter, is often a moderate bearer, sometimes a great bearer, and the bunches are short. The *White Grape* (fig. 70) is

the largest white currant, being nearly half an inch in diameter if well cultivated, with long bunches, and excellent flavor. The *Victoria*, a late,

Fig. 69—Cherry Currant.

Fig. 70—White Grape Currant.

Fig. 71.

acid sort, has long bunches, and red berries. *Knight's Sweet Red*, is a tolerably good sort, called *sweet* because more insipid than most others. The *Black English* is well known for its high scent and musky flavor, liked by some, and much disliked by most. The *Black Naples* is like it, but larger and better.

Effect of Cultivation.—The remarkable hardiness and productiveness of this truly valuable fruit, have induced most land-owners to neglect wholly all care and culture of the bushes. In order to exhibit clearly the difference between good and bad management, we annex exact representations (fig. 71) of the size of the fruit, taken from two different bushes of the common red currant in the same gar-

den. The smaller bunch was taken from the old mass of bushes, growing thickly, stunted, and without pruning or culture. The larger was from a small, vigorous, and well cultivated bush in rich ground. The difference in size, should satisfy every one of the great loss sustained by a want of culture and attention.

The Currant, as a "Bush" and "Tree."—It is often recommended to train the currant into the *tree* form, or with a clean stem a foot high before branching. With good pruning and rich culture, this will make far better crops than old, neglected, brush-like, grass-grown bushes. But they do still better, if equally well cultivated, without the single naked stem, and with shoots springing from the ground. They must have all wood older than three years cut out, and an even, well-distributed top of strong and thrifty branches.

THE APPLE.

Apples for Cooking.—The two apples generally regarded best for stewing, are the *Fall Pippin* for autumn, and the *Rhode Island Greening* for winter. There are two others better,—namely, *Comstock's Garden Apple* for autumn stewing, and the *Esopus Spitzenburgh* for winter. The former, without sugar, was found quite equal to the Fall Pippin, with a moderate sweetening. It is worthless as an eating apple, being always hard. (It was described a few years ago in the Cultivator.) The Spitzenburgh is unequalled for richness and high flavor. The *Red Astrachan* is an admirable early summer stewing apple, but requires much sugar; the *Keswick Codlin* is the best immediately following it. For baking, the *Sweet Bough* is best for summer, *Pound Sweet* for autumn and early winter, and *Tallman Sweeting* for winter, the latter standing unrivalled among all baking apples, for its honied sweetness.

Molasses from Apples.—J. Macomber, of Farmington, N. Y., manufactures molasses from sweet apples, incomparably better than by boiling down "sweet cider" so commonly practiced, by first *steaming* the apples soft, then pressing out the juice and boiling down. The juice thus yields a liberal quantity, but the precise amount he has omitted to determine.

A Productive Young Orchard.—The following fact, stated by Benjamin Hodge of Buffalo, at the winter meeting of the Fruit Growers' Society of Western New-York in 1857, shows the effect of good management and excellent cultivation. In 1848, he sold a gentleman a hundred apple trees, mostly Baldwins and Greenings. In 1855, he picked from them 120 barrels of apples. Many of the Baldwin trees bore three barrels each.

THE PEAR.

Fire-Blight in Pears.—There are two remedies for the fire-blight—both taken together will maintain any pear orchard undiminished. The first is the well-known remedy of cutting away the diseased parts—doing it promptly and continually, and two or three feet below the black-

ened portions. This will save many trees. Where the trees die in spite of this treatment, then adopt the other remedy, proposed by P. Barry, namely, whenever one tree dies, plant out two more. It is only occasionally, and often but a single year in many, that the fire-blight is extensively prevalent.

Two-Hundred-Dollar Trees.—The writer knows many instances where old trees of the Virgalieu or Doyenne pear, have yielded on an average of years, for a long period, not less than thirty dollars per annum—some years they yielded much more. What then would be the actual value of such trees? Should they continue perpetually, their value would of course be a principal of which thirty dollars is the interest; but although they have borne perhaps thirty years, and may yet much longer, they must some time perish. Calling them, therefore, half that amount, they will be worth two hundred dollars each. Some of them, we know, have already yielded much more than two hundred dollars. Doubtless there are several other varieties of the pear, when known and tried, which will prove equally profitable.

Ripening Winter Pears.—The recent experiments of cultivators are establishing the fact, that the great secret of the successful ripening of winter pears, consists in *growing* them well. *Well-grown* specimens of the Easter Beurre, Lawrence, and Winkfield, have been kept in barrels in a cellar and have ripened perfectly. At the winter meeting of the Fruit Growers' Society of Western New-York, in 1857, P. Barry presented a fine dish of Easter Beurre pears, taken a day or two before from the barrel in which they had been kept, and they were found to be excellent. Their good qualities had been *fully developed on the tree.*

THE CURCULIO ON THE PLUM.

Catching Curculios.—The most effectual means of destroying the Curculio, is to combine the "pig-and-poultry" remedy, and the *jarring* mode. Let pigs and poultry pick up all the wormy fruit that falls; and let all the egg-laying insects be destroyed by jarring down. To make the latter easy and expeditious, make light square frames of bamboo or lath, and cover them with white muslin. Each piece of muslin is attached to two square frames, so as to fold together like a port-folio or book. These are spread under the tree, as shown in the cut, (fig. 72,) an

Fig. 72.

axe or hammer is struck sharply against the *sawed stump* of a limb, and the frames being folded, throw the insects together, and they may be then emptied into hot water. *Shaking* the tree will not do—it must be jarred sharply—and not a day must be omitted. One man will carry two frames and do the work rapidly.

The Curculio.—Ellwanger & Barry destroy this insect by beating the ground hard and smooth, and then daily sweeping up the fallen wormy fruit and destroying it. This is similar in effect to consuming the fallen fruit by turning in swine and poultry. Their success is so complete that in last year (1856) they had *ninety-three* distinct varieties of plums in bearing, many of the trees heavily loaded, while others adjacent bore none.

PRUNING AND GRAFTING SHEARS.

Good treatment of fruit trees is always promoted by convenient tools; and the excuses for negligence are lessened with every facility for their proper management. For many of the operations of pruning, shortening-in peaches, &c., where branches not over an inch in diameter are to be cut off, the hand-shears will be found exceedingly convenient, and do the work with thrice the rapidity of the knife.

These are usually made as shown in the annexed figure, (fig. 73) and their great power depends upon the "draw-cut," or sawing motion imparted to the blade by their peculiar construction. The principal cutting blade has a movable center, so that when the handles are pressed together, the connecting bar *a* draws this blade downwards, giving it a compound motion, and increasing its power many fold over the simple cutting movement of a pair of scissors. The spring *b* serves to throw the shears open when not under the pressure of the hand.

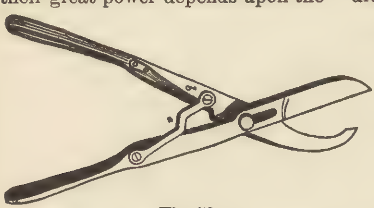


Fig. 73.

This instrument has been known among gardeners for many years. A much simpler mode of obtaining the full power of this *draw-cut*, more especially as applied to cutting off and slitting stocks for grafting, was described some years since in the "Fruit Culturist." It may, however, be applied with equal advantage to any kind of shears for pruning. The above figure (fig. 74) represents this instrument as used for grafting.

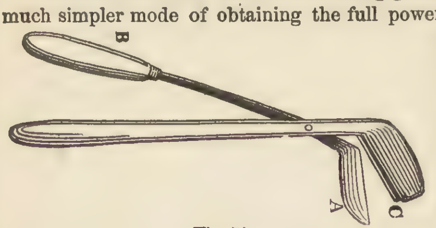


Fig. 74.

The thin blade A, two or three inches long, is set at an angle with the handle B, of about a hundred and twenty degrees, and for this very reason, when the shears are closing, the blade makes a draw-cut towards the concave bed C, which is placed against the stock to be cut. A tree an

Fig. 75.

inch in diameter is clipped square off by this tool, with as much ease as a jack-knife will clip a carrot. This grafting instrument may be at once transformed into shears for pruning, by substituting for the bed-piece C, another and blunter blade—(fig. 75.)

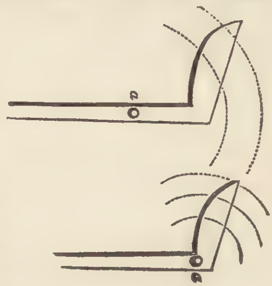


Fig. 76.

In order to make the principle of the working part of this instrument more clearly understood, we annex two simple figures, (fig. 76,) the one representing the objectionable mode sometimes adopted, of placing the pivot at the angle in the blade, the dotted lines (which are nothing more than circles described around the pivot *a* as a center,) clearly showing that this blade cuts only at right angles, and consequently does not possess the power of the other blade, where the pivot being placed below the angle, the cut is made obliquely,—it has the *draw-cut.*

FRUIT LADDERS.

Convenient fruit-ladders greatly facilitate the gathering of fruit, prevent its becoming bruised, and save it from mutilation by chafing. A very simple, cheap, and convenient self-sustaining ladder, is represented in fig. 77, the legs and cross-rods of which may be about the size of, or slightly larger than those of a common chair. The small plank platform at the top may be six by nine inches. The whole may be about three feet high, and will be nearly as light as an ordinary chair, and it will be found extremely useful among the smaller trees, or for the lower parts of full-grown ones.

Fig. 77.

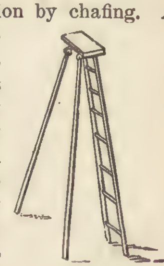


Fig. 78.

The form represented in fig. 78, having two folding legs, like those of a tripod, turning on joints, may be from 6 to 10 feet high.

An improvement of the latter has been made by continuing the two

sides of the ladder to a point, *a*, fig. 79, which the more readily enables the operator to thrust it up among the branches, and often enables him to support himself by holding to it. The legs turn at the hinges, *b*, and may be folded up to the ladder when not in use, as in the preceding instance.

Fig. 79.

The *Orchardist's Crook*, (fig. 80,) consists of a light rod, with an iron hook at one end, and a piece of wood made to slide along it. It enables the operator to draw down the flexible branches of fruit trees within his reach, and retain them there while the fruit is picked from them. In using it, the operator draws down the end of the branch with the hook, and fastens it by the sliding piece to another branch below. The slider passes freely along the rod when not in use, but ceases to slide by the friction of the side-strain, when fastened to the branch.

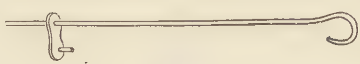


Fig. 80.

The *Folding Ladder* may be closed together with the facility of a pair of compasses; it then becomes a round stick, easily carried in one hand. It is made of strong light wood, and its construction may be readily understood by figure 81, representing the ladder as open, as half-closed, and as closely shut. An enlarged longitudinal section shows the manner in which the rounds lie in the grooves or concave beds in the sides or styles; above which is a cross-section exhibiting the semi-oval form of the styles. The ends of the rounds turn on iron pins, slightly riveted outside. The rounds resting on shoulders, when the ladder is opened, render the whole stiff and firm. A ladder of this construction is found very useful, not only in fruit-houses, where a common ladder could not be conveniently carried, but in pruning standard trees,

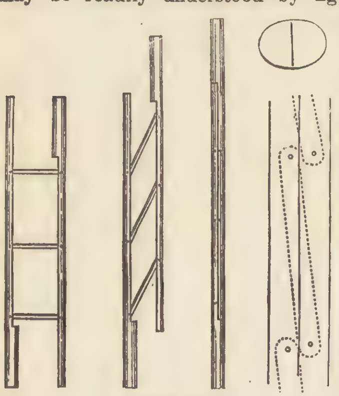


Fig. 81.

because it can be thrust through the branches like a round pole, without the least difficulty, and when once there it is easily opened.

LIST OF THE BEST FRUITS.

The following list of the best sorts of fruits, has been adopted at the several sessions of the American Pomological Society, and is perhaps as perfect a selection as could be made for general application. But different cultivators, in particular localities, will perhaps prefer leaving out some of them and adding others which experience may prove better adapted to those localities. No two persons would make the same selections throughout, and the list may therefore be modified to suit all.

APPLES.

FOR GENERAL CULTIVATION.

American Summer Pearmain,
Baldwin,
Benoni,
Bullock's Pippin,
Danvers Winter Sweet,
Early Harvest,
Early Strawberry,
Fall Pippin,
Fameuse,
Gravenstein,
Hawley,
High Top Sweeting,
Hubbardston Nonesuch,
Lady Apple,
Ladies Sweet,
Large Yellow Bough,
Melon,
Minister,
Porter,
Primate,
Rambo,
Red Astrachan,
Rhode Island Greening,
Roxbury Russet,
Summer Rose,
Swaar,
Vandervere,
William's Favorite, (except for light soils,)
Wine Apple, or Hays,
Winesap.

FOR NOTHERN LOCALITIES.

Ribston Pippin.

VARIETIES WHICH PROMISE WELL.

Autumn Bough,
Broadwell,
Coggswell,
Carolina June,
Fallenwalder,
Genesee Chief,
Jonathan,
Jeffries,
King of Tompkins County,
Ladies' Sweet,
Monmouth Pippin,
Mother,
Primate,
Smith's Cider,
Smoke House,
Wagener,
Winter Sweet Paradise,
Winthrop Greening or Lincoln Pip.

FOR PARTICULAR LOCALITIES.

Canada Red,
Æsopus Spitzenburgh,
Newtown Pippin,
Northern Spy,
Yellow Bellflower.

FOR GARDENS.

Garden Royal.

PEARS.

FOR GENERAL CULTIVATION.

Ananas d'Ete,
Andrews,
Belle Lucrative, or Fondante d' Automne,
Beurre d'Anjou,

Beurre d'Aremberg,
Beurre Diel,
Beurre Bosc,
Beurre St. Nicholas,
Bloodgood,
Buffum,
Dearborn's Seedling,
Doyenne d'Ete,
Doyenne Boussock,
Flemish Beauty,
Fulton,
Golden Beurre of Bilboa,
Howell,
Lawrence,
Louise Bonne de Jersey,
Madeleine,
Manning's Elizabeth,
Paradise d'Automne,
Rostiezer,
Seckel,
Sheldon,
Tyson,
Urbaniste,
Uvedale's St. Germain(for baking,)
Vicar of Winkfield,
Williams' Bon Chretien or Bartlett,
Winter Nelis.

FOR CULTIVATION ON QUINCE STOCKS.

Belle Lucrative,
Beurre d'Amalis,
Beurre d'Anjou,
Beurre Diel,
Catillac,
Duchesse d'Angouleme,
Easter Beurre,
Figue d'Alencon,
Glout Morceau,
Long Green of Coxe,
Louise Bonne de Jersey,
Napoleon,
Nouveau Poiteau,
Rostiezer,
Beurre Langelier,
Soldat Laboreur,
St. Michael Archange,
Urbaniste,
Uvedale's St. Germain, or Belle Angevine, (for baking.)
Vicar of Winkfield,
White Doyenne.

VARIETIES WHICH PROMISE WELL.

Adams,
Alpha,
Beurre d'Albret,
Beurre Clairgeau,
Beurre Giffard,
Beurre Kennes,
Beurre Langelier,
Beurre Nantais,
Beurre Sterckman,
Beurre Superfin,
Brande's St. Germain,
Brandywine,
Chancellor,
Charles Van Hooghten,
Collins,
Comte de Flanders,
Conseillier de la Cour,
Comptesse d'Alost,
Delices d'Hardenpont d'Belgique,
Delices d'Hardenpont d'Angers,
Doyenne d'Alencon,
Dix,
Doyenne Goubault,
Duchesse d'Orleans,
Duchesse de Berri d'Ete,
Emile d'Heyst,
Epine Dumas,
Fondante de Comice,
Fondante de Charneuse,
Fondante de Malines,
Fondante de Noel,
Hosen Schenk,
Jalousie de Fontenay Vendee,
Kingsessing,
Kirtland,
Limon,
Lodge (of Penn.,)
Niles,
Nouveau Poiteau,
Onondaga,
Osband's Summer,
Ott,
Philadelphia,
Pius IX.,
Pratt,
Rouselette d'Esperen,
St. Michael Archange,
Steven's Genesee,
Striped Madeleine,
Theodore Van Mons,

Van Assene, or Van Assche,
Walker,
Zepherine Gregoire.

FOR PARTICULAR LOCALITIES.

Grey Doyenne,
White Doyenne.

PLUMS.

FOR GENERAL CULTIVATION.

Bleeker's Gage,
Coe's Golden Drop,
Green Gage,
Jefferson,
Lawrence's Favorite
Lombard,
Monroe,
Purple Favorite,
Prince's Yellow Gage,
Purple Gage,
Reine Claude de Bavay,
Smith's Orleans,
Washington,
McLaughlin.

VARIETIES WHICH PROMISE WELL.

Bradshaw,
Duane's Purple,
Fellenberg,
General Hand,
German Prune,
Ives' Washington Seedling,
Munroe,
Pond's Seedling,
Rivers' Favorite.
St. Martin's Quetche,
White Damson.

FOR PARTICULAR LOCALITIES.

Imperial Gage.

CHERRIES

FOR GENERAL CULTIVATION.

Belle d'Orleans,
Belle Magnifique,
Black Eagle,
Black Tartarian,
Downer's Late,
Coe's Transparent
Early Purple Guigne,
Governor Wood,
Elton,
Early Richmond, (for cooking,)
Graffion or Bigarreau,
Knight's Early Black,
May Duke,
Reine Hortense.

VARIETIES WHICH PROMISE WELL.

American Amber,
Bigarreau Monstreuse de Mezel,
Black Hawk,
Great Bigarreau of Downing,
Rockport Bigarreau,
Hovey,
Kirtland's Mary,
Ohio Beauty,
Walsh's Seedling.

FOR SPECIAL CULTIVATION.

Napoleon Bigarreau.

APRICOTS

FOR GENERAL CULTIVATION.

Breda,
Large Early,
Moorpark.

NECTARINES.

FOR GENERAL CULTIVATION.

Downton,
Early Violet,
Elruge.

PEACHES.

FOR GENERAL CULTIVATION.

Bergen's Yellow,
Crawford's Early,
Cooledge's Favorite,
Crawford's Late,
Early York, *serrated,*
George IV.,
Grosse Mignonne,
Morris White,
Early York, large
Hill's Chili,
Large White Cling,
Teton de Venus,
Oldmixon Free,
Oldmixon Cling.

VARIETIES WHICH PROMISE WELL.

Gorgas,
Hill's Chili,
Madeleine de Courson,
Susquehanna.

FOR PARTICULAR LOCALITIES.

Heath Cling.

GRAPES.

FOR OPEN CULTURE.

Catawba,
Diana,
Isabella.

UNDER GLASS.

Black Hamburg,
Black Frontignan,
Black Prince,
Chasselas de Fontainebleau,
Grizzly Frontignan,
White Frontignan,
White Muscat of Alexandria.

VARIETIES WHICH PROMISE WELL.

Delaware,
Concord,
Rebecca.

GOOSEBERRIES.

FOR GENERAL CULTIVATION.

Crown Bob,
Early Sulphur,
Green Gage,
Green Walnut,
Houghton's Seedling,
Iron-Monger,
Laurel,
Red Champagne,
Warrington,
Woodward's Whitesmith.

RASPBERRIES.

FOR GENERAL CULTIVATION.

Fastolff,
Franconia,
French,
Knevet's Giant,
Orange,
Red Antwerp,
Yellow Antwerp.

VARIETIES WHICH PROMISE WELL.

American Red,
Cope,
Catawissa,
Ohio Everbearing,
Orange,
Thunderer,
Walker.

STRAWBERRIES.

FOR GENERAL CULTIVATION.

Boston Pine,
Hovey's Seedling,
Large Early Scarlet.

VARIETIES WHICH PROMISE WELL.

Genesee,
Hooker,
Le Baron,
Longworth's Prolific,
McAvoy's Superior,
Scarlet Magnate,
Trollope's Victoria,
Walker's Seedling.

FOR PARTICULAR LOCALITIES.

Burr's New Pine,
Jenny's Seedling.

CURRANTS.

FOR GENERAL CULTIVATION.

Black Naples,
May's Victoria,
Red Dutch,
White Dutch,
White Grape.

BLACKBERRIES.

FOR GENERAL CULTIVATION.

New-Rochelle,
The Dorchester Blackberry.

WASTE OF MANURE.—Hercules was evidently a poor farmer. He turned a river into the Augean stables (containing many years of accumulated manure from thirty thousand cattle) and washed the contents all away. This is like the man who most ingeniously built his hog-pen across a brook, into which the cleanings could be dumped, and carried off without "trouble."

ANNUAL FLOWERS,

WITH DESCRIPTIVE LISTS AND METHOD OF CULTURE.

WRITTEN FOR THE REGISTER BY EDGAR SANDERS.

An *annual* is a plant, which, from seed, springs into and perfects its growth and seeds, and perishes during the same season; while a *biennial* lasts two, and a perennial many seasons.

Annuals are very generally distributed over the whole habitable globe, and form no inconsiderable portion of economical as well as ornamental flora. They also comprise many of our most troublesome weeds, as *purslane*, *chickweed*, &c.

Those ordinarily cultivated, are natives of many different countries, being more or less hardy according to the part of the world in which they are found indigenously, and are known to florists by the terms *hardy*, *half-hardy*, and *tender*. California is very rich in showy annuals, as is the Swan River Colony.

Fig. 82—Petunia punctata.

Quite a number have been vastly altered and improved by florists, from the normal type, or as they are found in a state of nature, and transformed into flowers of the richest description, as asters, stocks, marigolds, balsams, larkspurs, poppies, &c., all of which have exceedingly double flowers instead of single. Others, as morning glory, phlox drummondii, portulaccas, zinnias, &c., have had their flowers much enlarged and otherwise beautified.

These results should act as a stimulus for trial on others; it requires only a little patience, and a careful saving of seed from the best or curiously altered flowers.

Many annuals are admirably adapted to planting in masses, (that is one sort only in a bed,) especially such kinds as Portulacca, Phlox, Nemophila, and others; and any of them may be made to adorn mixed borders,

and fill up all gaps of early-flowering plants, as spring bulbs, or any plant dying down before midsummer.

The dwarf kinds, as Portulacca, &c., make the showiest of edgings, either to walks, or for a ring on the outside of other plants. A few do well mixed together, as Clarkia and Mignonette, the latter hiding the naked stems of the former. The same of the White Alyssum and Purple Candytuft, the Dwarf Gillia and Blue Pimpernel.

Mode of Sowing.—First sow one kind evenly over the bed, not too thick; then the other; when they come out into rough leaf, or as soon as they can be handled, thin them out so that they stand equally at regular distances over the whole bed.

They may also be sown ribbon fashion, that is, by taking a certain number of kinds, those having the primary colors for example, and which will arrange for height, and sowing, if in a circular bed, in concentric, equi-distant rings, having a patch of a conspicuous color, as brilliant scarlet or white, in the center, which plant if considerably taller than that chosen for the outside, so much the better. Any other device may be as readily adopted as circular, but none pleases so well.

Fig. 83—Purple Candytuft.

In sowing patches in mixed borders, (or indeed in any place,) always take a strong rake and loosen up the soil if not recently dug, and sow the seed wide enough to fill up the whole space required; draw the rake once or twice gently over the seed, and then give the soil a patting with the head of the rake, and all small kinds of seed will be buried deep enough.

Lupins, Sweet Peas, and similar seed, require planting about one inch deep; other seed in proportion. It is far better to leave such tiny seed as Lobelia gracillis, lying on the ground, than to bury too deep.

In sowing edgings for straight walks, stretch down the line for a guide.

It looks very slovenly to see a crooked edging to a straight walk. Curves should be regular for the same reason. If a neat thin row is required for an edge, draw a pointed stick along close to the line, and sow in the mark; if a wider edging, a practiced eye will be able to give the seed a wider berth without drill.

In light loose sandy soils, give the surface a gentle patting with the back of the spade after sowing. If a dry spell of weather intervene, the soil must be moistened with water each evening until the plants are above ground.

Fig. 84—Lupinus nanus.

Many kinds bear transplanting with the best results, if done carefully in dull or showery weather, particularly quite early in the season. The finest bed of Portulacca we ever had, was from those transplanted six inches asunder, flowering better and later in the season than beds sown and allowed to stand thicker.

The following kinds never do well transplanted, hence should always be sown in the bed they are to remain: Candytuft, Catchfly, Dwarf Convolvulus, Lupins, Malope, Poppies, Venus' Looking-glass.

Never be afraid to thin out annuals. Many give up their culture as a failure, simply because they allow them to grow too thick, and so choke each other. The larger kinds, as Balsams, are finest standing separately, and should never be less than one foot from each other, nor more than three in a hill planted triangularly. None but the very smallest sorts should be less than six inches asunder.

Remember, if given plenty of room, May-sown annuals of many kinds will continue in flower until frost comes, while if they stand thickly, they soon exhaust the soil, cease flowering, and look unsightly the last of the season.

Fig. 85—German Ten Week Stock

Seed Saving must be seen to systematically; that is, the seed must be watched and collected as it ripens; and if only for home growth, select only the finest and plumpest seed, usually that first ripened. Put it away in small bags of brown paper made for the purpose,—a nice occupation for evenings,—and mark legibly its common name at least, with any remark as to certain variety, &c. When all collected, give them a place in some room away from the drying influence of a stove or heater, or where it is at all likely to be damp.

Soil.—Most garden soils will grow annuals, but some kinds do better in sandy soils, while others prefer it stiffer. It should be well spaded up in the fall or spring; if the former, always to be stirred again deeply before sowing in spring. There are but few but require moderately rich soil, hence are generally benefited by turning in some manure.

In the absence of ordinary manures, a substitute can be always obtained in guano, pigeon or other dung, &c. Mix in six or eight times its bulk of sand or soil, and spread broadcast—a handful to every two or three square yards.

Hardy Annuals may be sown in April, May, or early in June, according to the earliness of the season in the different States; but to avoid failure, never sow too early—not until the earth is sufficiently warm to in-

sure a speedy germination. Many lay the fault to the seed, when it is more than probable the seed perished for want of the necessary warmth for germination.

In this region of country, the first or second week in May is about the best time to sow hardy annuals. In a month, more or less, they will be fit for transplanting, if required to be done—if not, they should then be properly thinned, giving each individual plenty of room.

For transplanting, choose a dull or rainy day, and take up carefully with a trowel, so that they may receive as little check as possible. Be

Fig. 86—Phlox Drummondi.

sure, in sowing or transplanting, to observe the height each kind grows, and act accordingly, keeping the dwarfest near the eye, and the tallest in the back-ground.

This class of annuals do finely if sown in September, so as to get strong enough to stand the winter, and Rocket Larkspurs better in this way than any other.

Tender Annuals require sowing in pots placed in a warm window, green-house, or better yet, a gentle hot-bed, in March. Those who aim at complete success in this department, will, as soon as the plants become strong enough, transplant them into small flower pots, three in a pot, to

be transferred to the open ground the same time that other pot plants, as Heliotropes, &c., are. It is only by doing this, that the more delicate tender annuals, as the curious Sensitive Plant, and a few others, can be made to ripen seed in this northern latitude.

In case the hot-bed is too expensive, or sowing in pots objected to, any of the tenderest will grow and flower if sown the last of May in the open ground, although not so finely.

HALF-HARDY ANNUALS are generally treated as the above, except they need not be kept so warm. In fact, with the assistance of a frame only, perhaps the best success can be obtained with these. The finer varieties of imported German Asters, do grandly sown in a cold frame, once transplanted if possible—if not, removed with all the fibres and soil that will hang to the root.

Fig. 87—DWARF CONVOLVULUS.

A box made shallow, say 4 or 6 inches, the size of the kitchen window, may be made to produce quite a quantity of choice asters and stocks, with very little care. As the days get warm, the box should be placed in the open air to harden off the young plants, or else the window opened quite wide.

There are some few flower seeds usually sold with annuals, more strictly green-house plants, such as Petunias, Verbenas, &c., but the latter plant being now so easily obtained in pots, it is hardly advisable to sow it as an annual except with the hope of new varieties, when of course choice seeds should be selected.

There are a few annuals frequently grown as green-house plants, and quite valuable for that purpose, as they help to enliven it, and afford cut flowers in the dreary months of winter. Of these may be named Mignonette and Sweet Alyssum, for their fragrance; the Nemophila insignis and maculata, for drooping plants, either in pots, vases, or hanging baskets. The best time to sow for this purpose is August and September, in the pots they are to grow, or elsewhere, to be afterwards taken up and potted.

The following list contains only those of first-class character, and about all really worthy of general sowing. The remainder (much the larger portion) being pretty, without great claim to notice. If our choice had

to be still further curtailed, we should choose only *Phlox Drummondii*, *Stockgilly*, *Asters*, *Mignonette*, *Rocket Larkspurs*, *Portulaccas*, *Balsams*, *Zinnias*, *Convolvulus*, *Four O'Clocks*, *Gillia*, *Alyssum*, *Candytuft* and *Petunias*.

LIST OF CHOICE ANNUALS.

Those marked H., hardy—H. H., half-hardy—T., tender.

Alyssum maritinum, or Sweet Alyssum—H., white, excellent for greenhouse—6 inches.

Fig. 88—Rocket Larkspur.

Aster Chinensis, or China Aster, a well-known H. of many colors, and very beautiful.

Amaranthus caudatus, or Love-lies-Bleediug, and A. hypochondriacus, Prince's Feather—two H. plants, red —well adapted for the back of mixed borders—3 feet.

Balsamia hortensis, Balsam or Lady Slipper, known by every body—1 to 2 feet.

Cacalia coccinea, or Venus' Paint-brush—H.—scarlet, 1 foot.

Calendrina discolor, rosy purple—very pretty for massing—H.H.—1½ feet.

Celosia cristata, Coxcomb—scarlet, very showy—T.—1 to 2 feet.

Clarkia elegans, C. pulchella and C. alba—three very showy plants with rose, purple and white flowers—H.—1 to 1½ feet.

Collinsia bicolor, two-colored, and C. grandiflora, blue, Collins' Flower—H. —useful annuals—1 foot high.

Convolvulus major and minor—the well-known Morning Glory (twiner with many colored flowers)—and Blue Bindweed, very pretty—*trailing*.

Calliopsis bicolor, formerly Coreopsis tinctoria or Fair-eye—a very gay plant —H., and flowers best sown in the fall; C. Drummondii, yellow—1 to 2 feet.

Dianthus chinensis, or China Pink—many fine double varieties, remarkably pretty—H.H.—1 foot.

Delphinium ajacis, Rocket Lark-

spur—many varieties—superb if sown in fall—when in flower almost equal to a bed of Hyacinths.

Eschscholtzia crocea, orange, and E. californica, yellow—two pretty dwarf H. plants.

Erysimum Perowffskyanum—Hedge Mustard—a bright orange cruciferous plant—1 foot high—H.

Gilia tricolor, G. capitata, blue, and G. achillæfolia, large blue—three very pretty H. annuals.

Fig. 89—Portulacca.

Gomphrena globosa—red and white globe Amaranthus or Everlasting—should be sown for dry flowers in winter.

Iberis amara, White Candytuft, umbellata, purple, and odorata, white, sweet-scented—three very free blooming plants—1 foot—H.

Ipomæa quamoclit, the well-known Cypress Vine—fine twiner, with white and red flowers—T.—good for covering arbors.

Lathyrus odorata, or Sweet Pea—many varieties.

Lupinus, many varieties—they require to be partially shaded.

Lophospermum erubescens and scandens—two fine creepers with rose colored flowers, like a fox-glove.

Malope grandiflora, large red flowered, and white—good plants for back borders—H.H.—2 feet.

Mathiola annua, the well-known ten-week stocks, very showy and sweet-scented.

Maurandia Barclayana, blue, semperflorens, pink, and alba, white—beautiful climbing plants for pillars.

Mimosa sensitiva, or Sensitive Plant—grown for its curiosity—T.

Nemophila insignis, blue, and maculata, dotted—two very pretty low-growing plants—like the shade—H.

Phlox Drummondii, of many colors—the finest annual of all—creeping.

Petunia, many varieties—rich decorative plant.

Portulacca splendens, purple; Thorburnii, yellow; alba, white; elegans, crimson; and Thellusonii, red-flowered; —a very rich H. annual.

Reseda odorata—the well-known and highly-scented Mignonette.

Schizanthus—several varieties of beautiful flowers.

Shortia Californica—very showy—H., with yellow flowers.

Tagetus or Marigold—many very showy flowers.

Zinnia elegans—very showy plants, with many colored flowers—H.H. —2 feet.

GARDEN STRUCTURES.

A Cheap Vinery.—It is long since skillful gardeners in this country have attempted to raise the finer and more delicious exotic grapes in the open air. All the best sorts may be easily brought to perfection in a cold house, or one without fire heat, although by an artificial increase of temperature, they may be ripened some months earlier in the season.

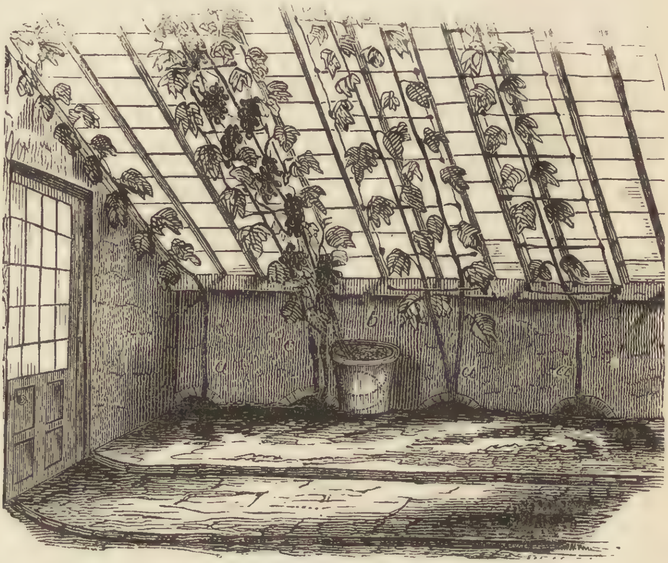


Fig. 90—Cheap Vinery.

In a former number of the Register, a design was furnished of an elaborate and costly vinery; the above is a view of one of a cheaper character, and within the means of nearly every land-owner. The back and ends are simply upright boards or plank, and are secured to posts like those of a common tight board-fence. It would be better and warmer, if the outside were clapboarded, and the space filled in with tan or saw-dust. Such grape-houses as this are sometimes placed against the south side of a carriage-house or other out-building, thus saving room and the cost of erecting a back wall. The following may be recommended as convenient dimensions, admitting, however, a few feet variation according to circumstances:—Height of back, 9 feet; of front, 3 feet; width, 10 to 11 feet; length 20 or 30 feet.

The border is best outside, to receive rains, but a portion may be inside; and must be three feet deep, well drained, ten or twelve feet wide, and filled with the richest materials.

The chief cost of this vinery is that of the sash and border.

Fig. 90 exhibits the interior of this grape-house.

A Cheap Green-House.—For those who are fond of flowers, there is nothing more interesting than their culture during the dreary months of winter. A few kinds will flourish well in the dry, hot, and changeable air of ordinary stove rooms; but it is not always convenient nor practicable to occupy the limited space of living-rooms in this way, and most plants will not succeed so well here as in a cooler and more uniform temperature. An ordinary green-house is a somewhat costly structure; and regulating the fire during a whole winter is quite a formidable task. For green-house plants, properly so called, or those which do best in an air but few degrees above freezing, we have lately adopted a plan which we find to succeed admirably with but little care, and without the cost or attention of fire-heat. Although this plan is not altogether new, we believe a description will be useful and acceptable to many of our readers.

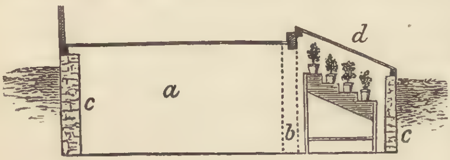


Fig. 91.

It consists of an extension made to an ordinary cellar, on the south side, and covered with a sash like that of a common green-house. Fig. 91 is a section, *a* being the cellar; *b*, the ordinary place of the south cellar wall, which is removed, leaving the space open to the green-house extension; *c c* are the walls, and *d* the sash. Fig. 92 represents the external appearance of this contrivance, showing the sloping sash, and a portion of the cellar wall, *w*, and siding of the building, *s*.

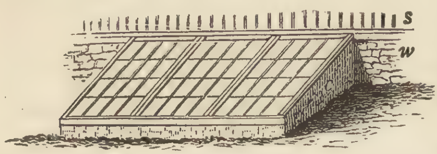


Fig. 92.

In order to obviate the necessity of fire-heat, it is requisite that so large a surface of sash should be double-glazed.

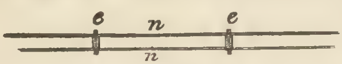


Fig. 93.

Fig. 93 exhibits a cross-section of this double sash, *e e* being the sash-bars, and *n n* the panes. The bars are made on *both* edges in the same form that ordinary sash is made on the glass side for the reception of the panes. We have had cross-bars made between these sash bars,

like ordinary window-sash, so that the lower panes are set in as in common windows, the upper or lapping panes merely resting on these cross-bars. This arrangement makes the window rather more secure from the passage of air, but is not absolutely necessary.

This structure being attached to an office where a fire above the cellar is not regularly kept up, sometimes needs a very small fire in a stove when the thermometer sinks to zero; but if connected with a dwelling constantly occupied, no artificial heat would be ever needed.

Fig. 94—Common Green-House.

The Common Green-House (fig. 94) is a more costly erection, of which the above cut represents one with double or span roof, of plain and simple but commodious construction. Our limited space will not allow us to enter into the details of its structure, or general management.

A Magnificent Green-House, or rather conservatory, is that of the Royal Botanic Gardens at Kew, in England, which are thrown open to the public, and occupy some 200 acres. Among other things which these gardens contain, are over twenty glass structures for plant houses, the largest of which is the enormous building containing the palm trees, which cost about $200,000. It is thus described in the Horticulturist: "It consists of a center and two wings, (as you will see by figure 95.) The whole length is 362 feet; the center is 100 feet wide, and 66 feet high; and the wings 50 feet wide, and 30 feet high. It is entirely constructed of iron, stone, brick, and sheet glass—not a particle of wood being about it. The roof is circular. The iron posts are inserted in great Cornish granite blocks. It is heated by 12 furnaces, and by hot-water

pipes and tanks, carried beneath the floor. The aggregate length of these pipes is about five miles. The smoke from the furnaces is conveyed through a subterranean flue, in a brick tunnel, 6 feet high, (through which one may conveniently pass,) to the distance of about 400 feet, where an ornamental shaft or tower is erected, 96 feet high. In the top of this

Fig. 95—CONSERVATORY AT KEW.

chimney and tower is a reservoir, to supply the houses with water; and at its base is a coal yard, and from this the coal is conveyed on a railroad through the tunnel alluded to. In the center of the building is a gallery 30 feet high from the floor, ascended by a spiral staircase. From this gallery the plants are easily watered over the top; and the taller plants are more easily examined, and appear to much better advantage than from the floor level. It is really a charming sight which you have from this gallery, looking down on magnificent *Palms*, *Sugar Canes*, *Cocoanut Trees*, the great *Strelitzia augusta*, and many rare and beautiful tropical trees, in the most healthy and luxuriant condition.

"It affords one some positive idea of tropical vegetation. The plants are all in tubs, so that each one is placed where it ought to be, and can be moved about as circumstances may require. All the pillars in the house are clothed with climbing plants of variety and beauty."

TOMATOES.—Short, thick, spreading bushes, sharpened and put into the ground by first making a hole with a crowbar, serve as an admirable support for the stems of the tomato plant, which, when loaded with its fruit among the spreading branches of the bushes, look like dwarf trees in full bearing.

A GOOD TOAST.—R. C. Winthrop furnished the U. S. Ag. Society, the following toast: "The farmers of the United States—may their policy and practice be such that we may never see America clothed in *weeds*."

THE KITCHEN GARDEN.

HINTS FOR ITS MANAGEMENT, TOGETHER WITH LISTS OF THE KINDS OF VEGETABLES BEST TO BE GROWN.

[Written for the Register by Edgar Sanders.]

The Kitchen Garden is so named from its being the spot where all kinds of vegetables are grown for the supply of the table. Its value is of the first importance, taking precedence of either fruit or flowers in well regulated households. The three, combined in just proportion to the wants of the family, constitute (or should do) one of the prime luxuries of a country over a town life.

To be able to grow one's own asparagus and pie plant early in the season, and from that time out enjoy all kinds of vegetables and fruits in due season, and inhale on one's own homestead, the perfume of a "thousand flowers," is a treat and luxury that all in the country may have, and yet how few do so.

Those who really enjoy to the full, the luxuries we speak of, must in the very nature of things possess an enviable home, while the very opposite is to be expected from those who neglect the opportunity.

It is altogether desirable to locate the culinary department by itself, excepting small fruits, which, from the advantage of a rotation of crops, are usually grown in the kitchen garden.

It is injudicious, to say the least, to mix flowers with vegetables, as, if there is any room for flowers, and there always should be, it can as well be so arranged to have the flowers by themselves and nearer the dwelling. Besides, straight lines should prevail in the vegetable department, and hence in the case of city or small amateur gardens, the two departments should be defined, and slightly separated by an evergreen hedge, or some shrubs do well for the purpose.

In the way of a choice of soil or situation, it does not often happen to be a matter to decide on; when it does, a gentle declivity to the south or south-east is the most desirable, while a retentive loam forms the best basis for a good soil.

But never let a clay or driving sand even, deter you from the good work, as the former is easily subdued by draining, thorough exposure to the frosts of winter by means of ridges, and applying all light loosening materials that can be got at, as coal ashes, sand, road or street sweepings, refuse from the woods, and similar material. Blowing sands are also to be improved by the opposite practice.

In all cases, draining of soils inclined to be wet at certain seasons, should be among the first operations.

Its form is best a square or parallelogram, the outside boundary furnished with a board fence six feet high, which can be covered with cur-

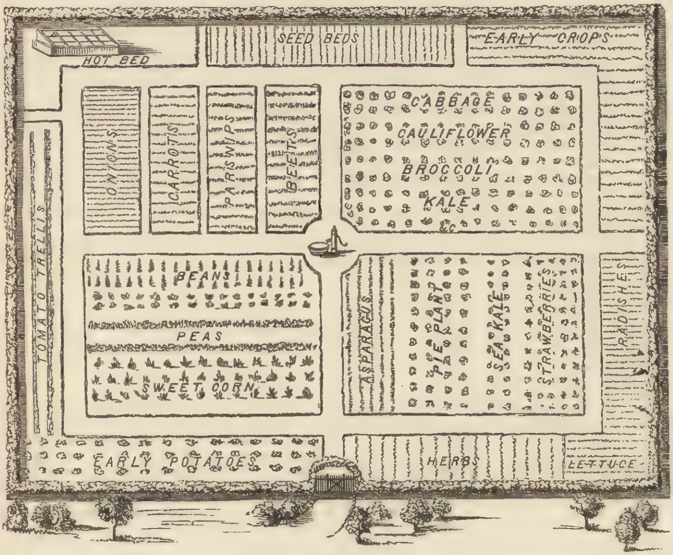


Fig. 96—Kitchen Garden.

rants, tomatoes, &c., during summer; or it may be a good stout hedge. It must be recollected that the hedge or fence performs one office beyond that of preservation, being very useful to break off the cold winds. A shelter of evergreen trees planted a short distance off, is another useful feature in breaking the north-west winds.

The size must be entirely regulated by the wants of the family; but one acre, thoroughly tilled, can be made to produce an immense amount of stuff, while not a few families would find it difficult to use all that could be grown on half an acre, if we leave potatoes and a few winter store vegetables to be otherwise provided for.

Gardens of small extent, or those belonging to amateurs, are usually cultivated by the spade, and may have the walks extending around the piece 7 to 10 feet from the outside, with cross-walks each way in the center; but large gardens, and most farmers' kitchen gardens also, will be cultivated with the plow.

Walks in gardens under the plow, interfere much with its thorough execution; hence it is best to have only a few permanent walks, alley ways being provided for attention among the crops.

Deep cultivation and manure without stint, are the price of the richest

kind of vegetable growing; hence trenching or subsoiling should be so arranged that the whole might come every three seasons under its influence.

Rotation of Crops also forms a good opportunity of changing the soil, or rather the crop to the soil, every third year or so. Thus, if the root crops for example, are kept by themselves and changed each year, the act of taking them up will answer the place of a good soil-loosener. The same holds true of celery.

Quick growth suits vegetables; hence a rich soil or one made so by abundance of manure, is a point of the first importance. Artificial manures, whether applied in a liquid form (which is best) or otherwise, will be a powerful stimulus to any crop thought to be on too poor a soil.

Having said thus much preliminary to our subject, we now come to speak of the different kinds of vegetables, and the mode of treatment suitable to them.

For the sake of condensing as much as possible within prescribed limits, we will arrange them under the following heads, viz:

ROOT CROPS.

These include carrots, beets, parsnips, scorzonera or oyster plant, to which may be added onions, although entirely dissimilar, which crops require to be all sown about the same time, usually as soon as the land gets into workable condition in the spring. These crops do best in deeply pulverized soil; hence, if kept together, the piece intended for them can always receive extra digging or subsoiling, and by changing the soil each year, a rotation is secured, and the land at stated periods subjected to deep cultivation.

Sow in drills one inch deep, from nine inches to a foot apart—in large field operations fifteen inches is better. Each kind can be thrown into a separate bed of eight or more feet wide, for convenience of weeding, but this is entirely optional, a point of greater importance being to form the land into beds for the onions and carrots at least, with an alley between, deep enough to carry off all surface water, in cases where the land gets water-logged at certain seasons. Thin out all but the onions to six or nine inches apart in the row. Onions may stand much thicker; in fact, if they are so thick that there is not room for each other to swell, they will crowd and ride in very rich land, and produce abundantly. If, however, onions of equal size are wanted, thin out to four or six inches apart. The onions will come off in time to receive a crop of cabbage or other vegetable. If the latter, they should be planted before the onions are quite ripe.

Among root crops, must not be forgotten turnips and ruta bagas. July and August is the time to sow them; hence early crops may be taken off the ground previously.

The above are the main crops, principally for winter use; besides these,

an early sowing should be made of beets, (turnip-rooted,) Early Horn carrot, and a bed of Early Stone turnip, on the warmest border in the garden, to come in for first use.

In very early sandy soils, the seed may frequently be sown by the last of March or beginning of April, and if the young plants are protected with a few boughs, some litter, or the like, a very early crop will be the reward.

Do not forget to make a sowing of onion seed very thick, to furnish "sets" for another year. By being so very thick they ripen off in July; if they do not, they must be pulled up, dried, and stowed away till next spring.

Root crops are stowed away in dry sand in the vegetable cellar for winter use. The sand keeps them plump and fresh.

BRASSICA OR CABBAGE TRIBE.

This is one of the most important, and includes cauliflower—sown in September for early spring use, and in May for fall use, and is a vegetable of the very first character.

Brocoli is similar to cauliflower, but hardier, and comes in use in the fall—not quite so delicate, but still rich and good.

Brussels sprouts, Scotch and other kales also, must not be forgotten, all of which are sown in May, planted out in July, and fit for use in fall and winter.

Lastly, but by no means least, comes the cabbage, too well known to require much description. These should always be in supply from year's end to year's end. Those intended for first use to follow the winter-kept ones, being kept all winter along with cauliflower and brocoli plants, in pits or frames. Plantations should be made of this tribe, at short intervals from May to August, to keep up succession. Dig the soil up well, and do not fear to use strong manures. Night soil, slaughter-house manure, and the like, are excellent for this crop.

For keeping over winter, sow in September, and plant out in spare frames, pits or cold vineries, when large enough, and protect slightly in severe weather. In the spring, as soon as the days are favorable, transplant carefully into good rich soil. For fall and winter use, sow in May—transplant when large enough into well prepared soil.

The fly is very troublesome to this tribe of plants. Nothing is so effectual to destroy them as tobacco dust applied in the morning from a very fine sieve.

Cabbages keep finely if suspended in a cold cellar to the beams. Those wanted for spring may be laid in the ground, roots up, covering the cab bage some six inches. Brocoli or cauliflower will head readily ir winter in a shed or cellar.

BEANS, PEAS, &c.

Another quarter of ground may include the various kinds of the above crops, along with which may be planted sweet corn, and perhaps squash, and a few early potatoes.

Potatoes, usually, are freest from disease in fields; hence it is best to reserve the garden for other crops, where there are fields to grow the store potatoes in, growing enough only to last till digging-up time.

Lima beans, to economize space, may be grown to single poles skirting the main walks, or to a trellis covering the same, thus forming a shady arbor. Three to a hill is plenty. If in rows plant four feet apart.

Bush beans are sown every three weeks until August, which gives successional crops—have the rows two feet apart. Cucumbers may be sown between the Limas.

Peas will require sowing three separate times, at intervals of two or three weeks apart, which will carry this crop until the sweet corn comes in, when it is cared little for, and what is more, fails to do well during the hottest weather. Peas may be interlined with some of the cabbage tribe, or lettuce, radishes and spinach.

OTHER CROPS.

Tomatoes require sowing in a hot-bed, window or green-house, in February or March—afterwards potted into three, then six-inch pots, and finally planted in the open ground the middle of May. In limited areas, plant them in a row—one fifty feet long will grow as much as an ordinary family will use. Keep them tied up to a support—(fig. 97.) We put in some stout stakes, seven feet high, and nail slats lengthways to them. Wire strung from stake to stake, does equally well, as does an open sunny fence, to train them to. Once the fruit begins to set, pinch all the growing shoots beyond the fruit. It encourages fruiting very much. A slight thinning of the foliage hastens the maturity of the fruit.

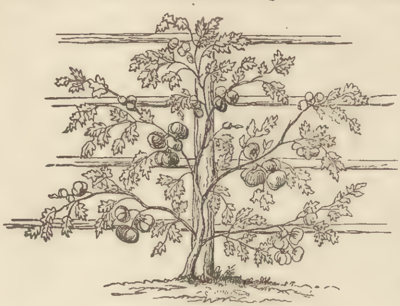


Fig. 97—Support for Tomato Plants.

Lettuce, and other kinds of salads, should be sown for succession the whole season,—endive taking the place of lettuce during dog days, and turnip-rooted the place of long radishes. The crops can occupy any spare ground, or the borders on the outside.

Celery must be sown the end of April or beginning of May—transplant-

ed once before final planting in July or August. No ground need be specially provided, as rows can be planted between peas, corn, &c.

One of the best ways to keep celery perfectly good all winter, is to select a dry piece of ground, and open a trench a foot wide, and deep enough to take the celery standing upright. Shovel out the crumbs, and stand in the celery, roots and all, as thick as it will stand together. Press the soil up close to the heads at the side. Get some short pieces of board, and lay across the trench to rest other boards on, which will entirely close them in. Pile over the soil, and without any other covering it will keep perfectly fresh till spring. To get at a portion any time, cover over with long dung. Enough should be got out each time to last a month. This may be kept in sand in boxes, standing upright.

Squashes, cucumbers, and melons, will also have to be provided with a patch of land, which crops are best, sown in small oblong boxes, covered with a pane of glass to keep them from the yellow-striped bug and other insects. It is well to sow a few pots of each of these kinds in the hot-bed, to be afterwards transplanted, to come into use a little before those sown in the open soil.

Peppers of various kinds, egg plants, ochra and other fancy vegetables, require to be sown in a hot-bed first, or in its absence a warm window or green-house. When large enough, re-pot into small pots, three in a pot, and finally transplant to the open soil the middle or end of May, according to the season. The latter crops, together with many of the sowings of lettuce and other salads, a few herbs, as thyme, savory, parsley, &c., should not be sown or planted on the large square patches or quarters, but kept to the small borders on the outside.

HOT-BED.

This is a very necessary part of kitchen garden arrangements, and should be possessed by every one who has a rood of ground. A three-light frame will be a useful size, and one large enough for ordinary private use. The dimensions of such are about six feet one way, by nine or twelve the other—generally glazed with six by eight glass.

Having the box (usually called frame) ready, towards the end of February or early in March, collect some stable manure together, and let it heat for about a week before using. Choose a sunny aspect—south-east is best—and mark off a space one foot larger than the size of the box. Over this space build the manure precisely as though it was a hay-stack —that is, layer after layer, even all around, until the desired height is obtained—generally from two to three feet. Press it down pretty firmly, and set on the frame and lights.

Take the fork and well knock in the sides of the bed, which will materially assist in preserving a uniform heat. Let it stand a few days, and if the heat has risen, put in six to nine inches of soil. Insert a "trial

stick," and when on withdrawing the same it is found comfortably warm, the seed may be sown.

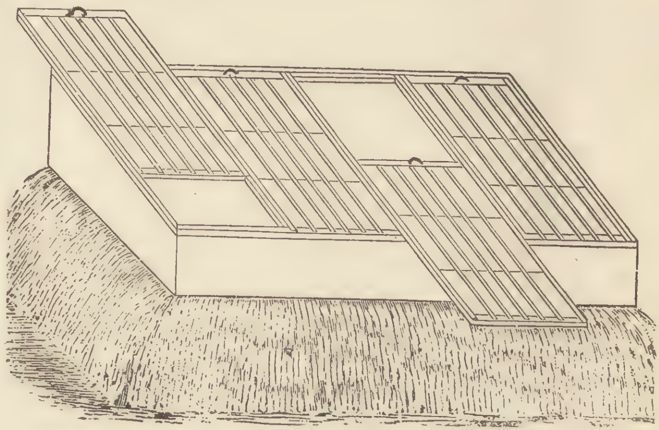


Fig. 98—Hot-Bed.

The seeds usually required to be advanced, are Early and Red cabbage, cauliflower, lettuce, radishes, tomatoes, peppers, egg plant, and sometimes ochra and martinias. Level down the soil, and sow the above, or any portion, and in just such quantities as the family requires. One light might be of cabbage and cauliflower, another of radish and lettuce mixed, while the third can be equally divided among the rest. Cover with half an inch of soil; press the soil gently with a piece of board, and water sufficiently to settle the soil. Air must be given in sufficient quantities to keep the temperature under 65°, without sun heat. Directly the plants begin to appear, give air quite liberally every warm day, and ultimately take off the lights altogether, first in the day, then in mild nights. This prevents the plants becoming spindly and weak.

All the above, except the radishes, are intended to be transplanted to the open soil, as soon as the soil is sufficiently warm.

In addition to the above, sow a pot or two of cucumbers, and when up into rough leaf, pot off three in a pot and nurture along in the warmest part of the frame, giving them a shift into larger pots if they require it. A portion of these are intended to plant out in the frames as soon as the other things can be got out of the way; the remainder to be planted out in a warm spot in the open border.

Before planting in the frames, loosen up the soil, and add a little fresh around the plants, for the young rootlets to work into. Keep the frame pretty close, and the plants occasionally picked back to induce a stocky

growth. When the vines have filled the box, raise it, and allow them to grow outside; gradually inure them until the frames and lights are all finally removed. Fruit will be fit to cut in June, and by the time these are done, those planted outside will be in, and by that time those sown in the open soil.

Some like to have half a dozen pots of melons to plant out in the same way.

Asparagus, pie plant, and sea kale, come under the head of permanent crops, and therefore are not mentioned in this treatise.

SELECT LIST OF VEGETABLES.

The following is a list of choice kinds of vegetables, all of known and tried value. The first of the different kinds mentioned in the list are those best for sowing in a hot-bed:

BEANS—Snap, Early Mohawk, Refugee, and White Bush Cranberry, and Large White Lima.

BEETS—Early Turnip or Bassano, and Long Blood.

BROCOLIS—Early White, Walcheren, and Purple and White Cape.

CABBAGES—Large Early York, Early Dutch, Late Bergen, and Late Flat Dutch.

CARROTS—Early Horn, Long Orange, and Altringham.

CAULIFLOWERS—Walcheren and Large Asiatic.

CELERY—Red and White Solid.

LETTUCE—Ice Coss, Curled Silesia, and Cabbage Head.

PARSNIP—Guernsey or Hollow Crown.

PEAS—Prince Albert, Champion of England, Bishop's Dwarf, and Blue Prussian.

RADISHES—Scarlet Short Top, and Red and White Turnip.

SPINACH—Round Leaved, and Prickly.

SQUASH—Summer and Winter Crook Neck, and Boston Marrow.

SWEET CORN—Early Sweet, Stowell's Evergreen, and Old Colony Sweet.

TOMATO—Large Red Smooth.

TURNIP—Early Dutch, White Short-leaved, Red Top, and Improved Swede or Ruta Baga.

BRUSSELS SPROUTS, KALE.

ONIONS—Large Red, Yellow Dutch and White Portugal.

EGG PLANT, ENDIVE, PEPPERS.

THREE POINTS are to be especially observed, in cultivating successfully Garden Vegetables. First, perfect freedom from weeds; secondly, thinning out where they have come up too thickly, for a superabundance of such plants retards the growth and development of the rest, in precisely the same way as weeds; and thirdly, keeping the ground mellow and the crust broken, by very frequent pulverization, especially if the ground is rather clayey.

FARM BUILDINGS.

ORNAMENTAL CARRIAGE HOUSES.

Carriage House connected with an Italian Dwelling.—We often notice, in works on Landscape Gardening, directions for concealing from view by trees, the barns and other out-buildings of the farm, with the evident understanding that they are and must be unsightly objects. We believe these directions to be founded in error, because among the most important comforts and conveniences of a country establishment, are good and commodious out-buildings. Indeed, they may in some degree be regarded as forming a union between the dwelling and the farm, in a manner somewhat similar to that by which a union between the house and ornamental grounds is maintained by means of architectural embellishments. At all events, a total absence of farm buildings would not be a pleasing sight on a fine and well cultivated farm, which should be conspicuous for all the comforts of home. Hence the true course, is obviously to improve those buildings, so that, at least, partly visible through trees, they may add to, instead of defacing the scenery.

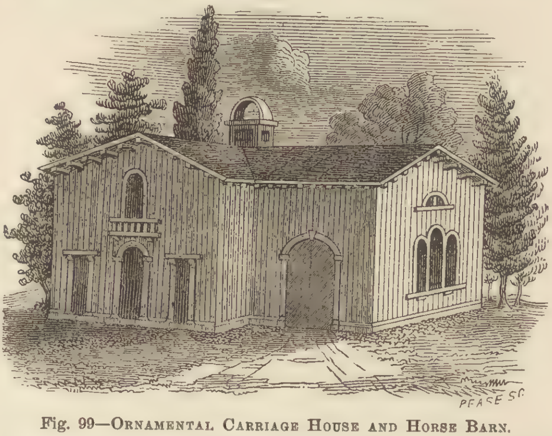


Fig. 99—Ornamental Carriage House and Horse Barn.

With the object of calling attention to the architecture of barns, we give a plan and view of a carriage house and horse barn, erected by a gentleman in the western part of the State. It is built in the Italian style, and required only a small expenditure for the completion of all its parts, above what is usually needed for buildings of this kind. In the plan it will be seen, that one part is for carriages, and the other a stable for horses, with several closets for oats, harness, saddles, whips, curry-

combs, carriage grease, &c. A part of these may be omitted, and more room left for carriages.

The perspective view (fig. 99) will be understood without much explanation. The part exhibited faces the dwelling, or the more frequented part; the back is mostly hid by trees. There are two false doors on the stable part, to add to the appearance, the actual entrance being near the corner. The chimney ventilator is an essential part. It should be remarked that the brackets, door-frames, projecting eaves, &c., are all made substantially of three-inch plank.

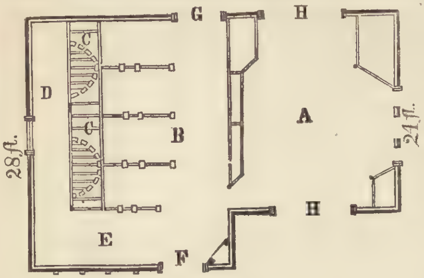


Fig. 100.

In the plan, (fig. 100) A is the room for carriages, B for horses, there being four stalls, the mangers C C containing two upright semi-circular racks for hay. The passage D, for feeding horses, is three feet wide, and E, three and a half. F is the entrance door to the stable, and G the manure door. The carriage-house doors H H, are each 8 feet wide, consisting each of two four-feet-wide doors. The height, 15 feet, leaves a spacious chamber for hay, the larger entrance to which is nearly over the manure door, G, and not shown in the view.

Carriage-House to accompany a Gothic Dwelling.—The accompanying well arranged and convenient plan of a carriage house and stable, possessing Gothic characteristics, was first given in the *Horticulturist*:—

This stable (figs. 101 and 102) is intended to produce a picturesque effect externally, and to contain internally all the convenience demanded in a building of this class. The central portion contains the carriage-house, with space for four vehicles, and a harness-room at the end of it. On one side of this is the stable—the stalls 5½ feet wide, with rack supplied with hay through wells, over each rack, in the floor of the hay-loft above. A flight of stairs leads from the end of the stable to the hay-loft above, and is placed here in order to prevent any dust from the hay-loft from finding its way into the carriage-house. On the side of the carriage-house are a tool-house and work-shop. All the doors in this stable slide upon iron rollers running upon a piece of plain bar iron above the door. These iron rollers are attached firmly to the door by iron straps, and the door, being thus suspended, not only runs much more easily and freely than if the track were at the bottom, as is usually the case, but the track is not liable to get clogged by dust or other matters falling upon the floor.

Fig. 101—Carriage House and Stable.

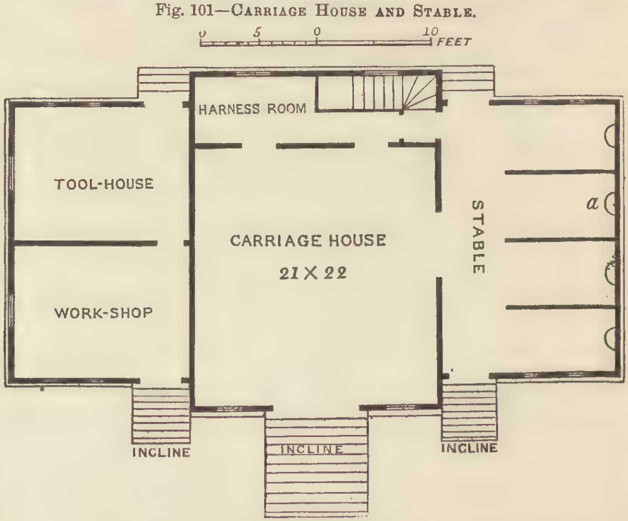


Fig. 102—Ground Floor.

Besides this, a sliding door in a stable, when opened, gives the largest possible egress in a given space, and can never stand in the way to the injury of horses or carriages passing in or out on either side.

The high roof of this building gives a good deal of room in the hay-loft, and the ventilation at the top keeps this space cool and airy at all seasons. The whole is built of wood, the vertical boarding battened in the ordinary manner.

A Sheep-Barn.—The barn here represented (fig. 103) is used by S. W. Jewett, of Weybridge, Vermont. It has two floors, thus doubling the accommodations. Such a building, 18 by 26 feet, with thirteen-feet posts, will afford room for two flocks of 60 each, including the space occupied by the feeding boxes. The apartments are lighted by side windows.

Fig. 103—Two-Story Sheep Barn.

"Some of these sheep-barns," observes S. W. Jewett, "I build of sufficient size to contain hay at one end. The cut here given shows one of this class, 25 by 34 feet; 12 feet at one end is occupied for storing hay; the door represented at A is the pitching hole. The basement is constructed with double doors of sufficient width for backing in a cart or sled. To accommodate in loading the manure from above, we raise a plank in the floor. Some of these sheds are erected near our hay-barns, where we can take advantage of the rising ground to obtain access for the sheep to the upper story. At other places the ground is artificially raised at one end, as in the accompanying draft." It is proper to remark that the upper floor should be so tight that the manure and urine should not fall on the sheep below, as it would injure their fleeces.

Chester County Barn.—A correspondent in Chester county, Pa., gives the following minute description of a large and commodious grain, hay, and stock barn, which combines many important advantages:—

Such a barn will require a locality inclining towards the south. Let the main barn, facing southerly, be 60 feet long and 40 wide, with a lean-to overshot extending in front 20 feet. I estimate this to contain near 100

tons of hay, &c.; then let hay-houses extend 20 feet in width and height, in the form of an L, from the west end of the barn, of such length as to afford the additional storage necessary—say forty feet each.

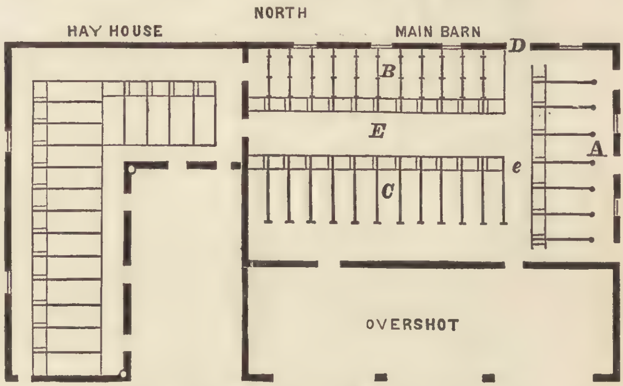


Fig. 104—Plan of Stables in Basement.

The ground floor of the main barn to be divided into stabling, is represented in fig. 104. A, horse stables, 12 feet in depth, with mangers $2\frac{1}{2}$ feet wide for hay, and small troughs at the side of each stall, for grain. B, cattle stalls, hung with swinging gates, opening sideways. C, the same, but each stall having a separate gate entering direct from the yard. E, main entry, 8 feet wide, to hold feed-chests, &c.; e, entry 5 feet wide, with steps up to door D, at the north end, and having an entrance into the horse stables at each end, the entries to be laid with small stone and mortar; the remaining space under the barn and overshot to be open to the yard, and furnished with box cribs, so that out-door stock can have their fodder placed under shelter in stormy weather; in cleaning out stables, the manure may also be placed under here for protection from the weather.

If additional *stall* room is desired, the twenty-foot hay houses might be divided by a five-foot entry on the outside, and stalls opening to the yard, as C; or the under story might be open to the yard, as additional shelter to stock and manure.

Fig. 105 gives the elevation of the west end of the main barn, 40 feet; overshot 20—the former having in front the large doors, 16 feet, and bridge wall; height to the square, 30 feet—to the second floor, 8 feet; this covers a granary extending through the center, 14 feet wide, boarded at the sides, and the hay-bins each side of it, 20 by 60 feet. It is lighted by two windows in front, and has a door and window at the north end. It is partitioned on one side into bins for grain; the front end included

in the overshot will make a good work-shop. The third or threshing floor, eight feet higher, extends 14 feet in width (same as granary, which it covers,) from the bridge-wall to the front of overshot, and is lighted

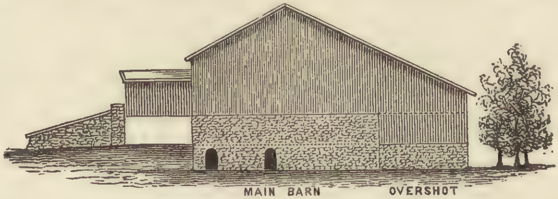


Fig. 105—End View from the West, before the Hay-bins were added.

by a small dormer in front of overshot—(this may be scaffolded over head after the side mows are filled, for grain,) the large doors at the north end opening into a dormer covering the space between the bridge-wall and barn. Each of the *main* hay mows should have a funnel four feet square, to pass hay to the entries below, and each of the overshot mows one to the yard. Grain from the threshing floor is passed into bins in the granary through three-inch square holes, stopped with wedge-shaped plugs.

And now, as to the advantages of this plan, which I believe are greater than embraced by any other that has come under my observation. Roofing is one of the most expensive parts of building—here is the greatest amount of storage, stabling and other accommodation, under the same surface; the hay not descending to the ground floor, is less liable to be affected by damp, and affords a much less harbor for rats and other vermin. In the hurried season of harvest, produce can be disposed of in the deep bays in one-fourth of the time required to pitch it upwards, and in winter can be dropped *immediately* where wanted below—while the stables can all be shut tight in cold weather, to keep them warm. The hay funnels act as ventilators to carry off impure air; grain, when threshed, is put away in the granary without any labor of bagging and carrying; the horse stables are entered without passing through the cattle-yard, and the cattle stalls are as conveniently arranged as in other plans. The space under the bridgeway may readily be converted into a carriage or wagon-house; hay-houses, as proposed, or sheds in their place, would afford comfortable protection from north and west winds. I suppose the main barn to be built of stone at least as high as the third floor, except in front; the overshot may be of frame, on pillars level with the granary floor, or its ends may be a continuation of the barn walls. The above general plan, varied in size and details, receives the general sanction of the practical farmers of Chester county.

Granary and Wagon-House.—The accompanying excellent plan was furnished by T. B. Arden, of Putnam Co., N. Y., for the Country Gen-

tleman, and the building it describes would prove a valuable one for every large grain farm. The following is his description:—

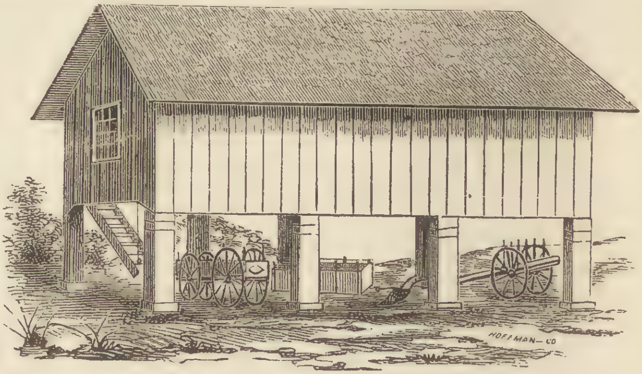


Fig. 106—Granary and Wagon-House.

You will observe the posts are placed upon blocks of granite. These are sunk three feet in the ground, and rise fifteen inches above it; the former is to resist the action of frost; the latter to prevent decay in the foot of the post, from the effects of moisture from the earth, this having been determined as the necessary height.

Directions for Building.—Building to stand north and south, for purposes of ventilation. One window in each end, 12 lights 9 by 12, under gallows girt. The space *d*, (fig. 107,) in elevation of end, to be floored for storage purposes. The braces *c*, *c*, to be dispensed with in the two middle bents.

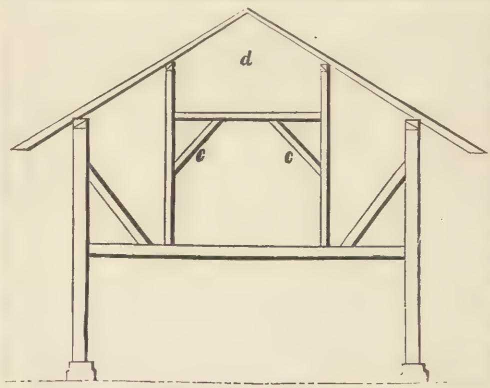


Fig. 107—Elevation of End.

The bins to be lined with half-inch stuff, jointed only. The bin posts should be plowed, that the bin boards on the hall may be taken out, or slide freely up and down to lessen the labor of filling and taking out grain.

The floor timbers should have a slight camber on the upper edge, to prevent the floor from becoming concave by the burthen it may have to sustain. The building should be well framed, to enable it better to resist the force of the wind, to which it is very much exposed by its peculiar build.

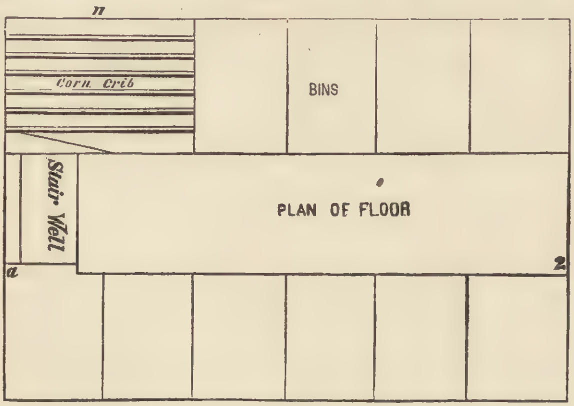


Fig. 108.

The posts are to be provided with a belt of tin one foot below the inter-ties.

The siding of the corn-crib at *n*, (fig. 108,) to be made of strips, 2¼ inches wide, and placed one inch apart, same as floor.

The corn-crib should be placed in the south-west corner, if possible, or better perhaps, in that exposure which would best protect it from the prevailing storms of the district of country.

The stairway is closed by a trap-door, the steps hung between the two first-floor timbers, which are placed three feet apart for that purpose; hooks are secured to the end of each side strip, and caught into staples on the inside of the timbers. These serve as hinges; and the other end is sustained by a counter-weight, when they can be let down or put up at pleasure, thus cutting off access to rats and mice.

Care of Bees.—Bees should be examined once a week all winter, to see if all is right. This is much easier than to attend to pigs, sheep and cattle three times a day, which no good farmer complains of. What is termed *luck* with bees, is another name for careful and skillful management.

VARIOUS FACTS IN TILLAGE.

Depth of Sowing Wheat.—Wheat may be sowed too shallow as well as too deep. The depth must vary with the nature of the soil. A thinner covering is required in a close heavy soil, than in one light gravelly or sandy. The following experiments were made by Petri, the results of which would vary with the moisture or dryness of the soil. They are given as a specimen of trials of this kind, which if often repeated by farmers, would afford them much valuable information.

Seed sown to a depth of	Appeared above ground in	Number of plants that came up.
1-2 inch	11 days	7-8ths.
1 "	12 "	all.
2 "	18 "	7-8ths.
8 "	20 "	6-8ths.
4 "	21 "	1-2.
5 "	22 "	3-8ths.
6 "	23 "	1-8th.

Good Rotation.—A successful farmer, who has enriched his farm, while he has enriched himself from it, pursues the following course: First, he takes especial pains with MANURE, wastes none, saves all, mixes well in the yard, (not by forking over, but) by a proper distribution of straw, stable cleanings, &c. Next, he makes corn his leading crop, as affording both grain and fodder, and as being all returned to the soil, in feeding all to animals, except what is sold in beef, pork, &c. The *first year*, the corn has all the manure in spring, at about 25 loads per acre. The *second year*, oats, barley, or spring wheat follows. In the autumn, sow winter wheat, which constitutes the *third year's* crop. This is seeded down to clover, which (being plastered) constitutes the *fourth* and *fifth year's* crop in meadow or pasture.

The Wheat Crop Improving.—John Johnston of Geneva, N. Y., is one of the best farmers in the country. He first of all UNDERDRAINS; he then feeds his land well (with manure) and this enables his land to feed his large herds of animals; their manure feeds the land again; and both feed him and fill his pockets. He said, at the close of the year 1856, after all the unusual disasters which had happened to the wheat crop for some years previously, "*My own wheat crops for the last eight years, have averaged more than they ever did in the same length of time for thirty-five years.*" The reason he gives, he has sown *no wheat on undrained land*—added to the good farming described above.

Grass Lands.—No farmer should be satisfied with less than two tons of hay per acre from his meadows, and his pastures should be as good. There are several means of improving grass lands. If the land is wet, springy, or holds water in the subsoil, it should be drained. This may be easily determined by digging a hole two feet deep in spring of the

year, and if underdraining is needed, water will stand in it. We have known meadows greatly improved by draining. Next in order, are manuring and deep plowing, for previous crops. Last, but not least, is heavy seeding. We have succeeded in doubling the product of grass, by quadrupling the seed—and this paid well. We have known five tons of hay per acre, by sowing a bushel of seed per acre.

Heavy Dividends.—If one of our railroads should be known to pay *thirty per cent.* dividend annually, from its regular earnings, and the stock could be bought at par, what a furious rush would be made for it! Yet there is a way that farmers may invest in stocks at home, on their own lands, that will pay thirty to fifty per cent. yearly. This is in systematic *tile-draining.* We have known many who have tried it, and they generally say that it is paid for by the increased crops in two years. They are *good farmers*, however.

Heavy and Light Potatoes.—A. B. Dickinson states in Moore's Rural New-Yorker, that the *heavier* a potato, the less liable it is to rot, without regard to the age of the variety or its color. He tries their specific gravity by brine, of different degrees of strength, in as many vessels, some sorts of potatoes sinking quickly while others float. The only exception to this rule is the "Irish Cup," a heavy potato, but more liable to disease than any other of its weight.

Plowing Wet Land.—Underdraining is the great cure for the evils of wetness—but when underdraining has not been performed, it is important to know what is next best. Sward ground may be always plowed wetter than any other, without subsequent baking. Other land may be plowed when considerably wet, if it is left to dry before the harrow touches it; indeed it will generally dry more rapidly after plowing than before, if not plowed too wet. Plowing always tends to loosen the earth; and harrowing to render it more compact unless dry enough to crumble. More caution is therefore required not to harrow wet land, than in any other process of cultivation.

Cheap Farm-Laborer.—Farmers find it difficult to get laborers; but there is one chap, who so far as he goes, is an admirable workman, whose services may be had for nothing. This is Jack Frost—who if allowed to operate, will reduce much hard, clayey soil of autumn, into a fine mellow condition by spring, if turned up by the plow for his harrow to pulverize. This tool of his is remarkable for its myriads of fine, needle-like teeth, which enter between the minutest particles and tear them asunder into powder.

Long and Short Manure.—One great objection to using fresh or unfermented manure, is the difficulty of working its long fibres into the soil, and *mixing it finely with the earth,* a most essential operation. All these difficulties are surmounted, by cutting all the straw used for bedding. It need not be cut very short. If all the corn-stalks fed to cattle,

were first cut finely with a machine driven by horse power, the animals would eat much more, and there would be none of that peculiarly unmanageable manure occasioned by large corn-stalks. A friend of ours cuts all his stalks with a four horse power—an hour's cutting lasting a long time—and finds great profit in it every way.

Value of Straw in Manures.—It is found by careful chemical examination, that different kinds of straw possess quite different values, to work up into manure. This relative value is very nearly determined by the quantity of nitrogen they contain. Barley straw is the poorest of all; oat and rye straws are about one-third better; wheat is nearly double in value to barley; buckwheat is rather better than wheat; meadow hay and corn-stalks are far ahead of any of these, being five times as rich in nitrogen as barley straw; and red clover hay and pea-straw are each about eight times as rich as barley. Whether these substances are mixed directly with manure, or eaten first by animals, they produce their relative effects.

Manure Enriched by Grain.—Nearly every farmer is aware that the food controls the quality of manure, and that, for instance, dung from horses fed high on oats is quite a different thing from the droppings of grass-fed horses. Some kinds of grain contain more nitrogen than others, and of course impart more fertilizing power to the manure. Barley is the poorest, Indian corn a little better, and oats better than either by about 20 per cent., the three not being very unlike.

Harrowing Inverted Sod.—Farmers often find harrowing inverted sod to tear up the turf, and make grassy tillage. The double Michigan plow is a perfect cure, but not always at hand, and sometimes it may not be advisable to use it. Grass land which has been inverted by the common plow late in autumn, and which has been underdrained or is otherwise dry enough, may be harrowed very early in the spring, without the least disturbance of the sod, if done when only a few inches of the surface has thawed, and while the grassy portion of the sod is chained fast by ice.

Garden Rotation.—The following enumeration of the different families of garden vegetables will enable the gardener to plan a rotation, so that similar plants will not occupy the same soil in successive years—those classed together should not succeed each other.

1. Peas, beans.
2. Cabbage, cauliflower, brocoli, turnip, radish.
3. Carrot, parsnip, parsley, celery.
4. Potato, tomato, egg plant.
5. Cucumber, melon, gourd, squash.
6. Lettuce, salsify, endive, chicory.
7. Onion, garlic, shallot, leek.

IMPROVED DOMESTIC ANIMALS.

Although some of the finest imported specimens of domestic animals have been purchased at high, and apparently very extravagant prices; yet there is probably no way in which an expenditure of money effects a more extensive benefit, by diffusing and multiplying improved blood throughout the whole country, than by the introduction of these animals, however unprofitable it may prove to the importer or owner.

Accurate and well executed portraits of fine animals, assist in forming the judgment for deciding on their merits, and impart valuable information through the medium of the eye, as to their character, to those who cannot avail themselves of the sight of the animals themselves. With this object in view, the readers of the Register are furnished with representations of a few select specimens.

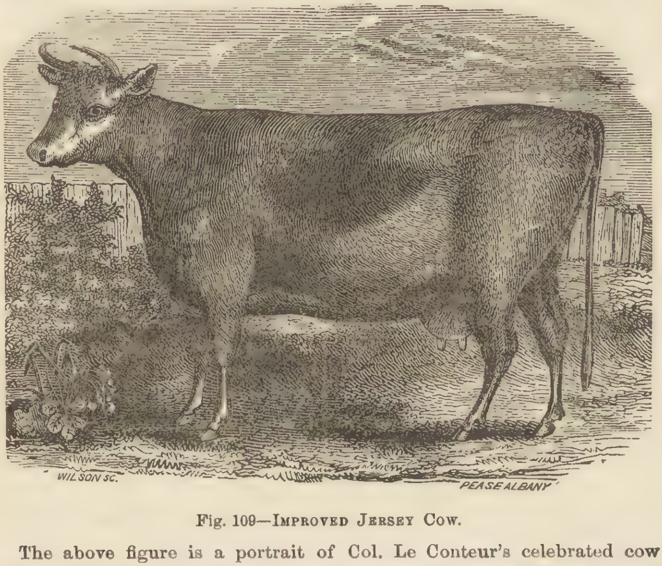


Fig. 109—Improved Jersey Cow.

The above figure is a portrait of Col. Le Conteur's celebrated cow "Beauty," of the improved Alderney or Jersey breed, which are a great improvement on the old Alderney cattle. This cow produced 11 lbs. 13 ozs. of butter weekly—giving 19 quarts of milk daily. Larger products have been obtained from some other individuals of this breed—a breed remarkable for the richness of the milk they afford.

The Suffolk cattle, although less highly improved than some other

Fig. 110—Suffolk Cow.

breeds, have some desirable qualities. They are one of the best of all the hornless cattle, and have been long noted as furnishing some excellent milkers; authenticated instances having occurred where thirty quarts have been given in a day.

Fig. 111—Silesian Merino Sheep.

Silesian Merino Sheep—(Fig. 111.)—The admirable representation exhibited in this cut is engraved from an accurate daguerreotype likeness. This kind of Merino is remarkable for its fineness of fleece, being scarcely inferior to the Saxons, without a corresponding diminution in the weight.

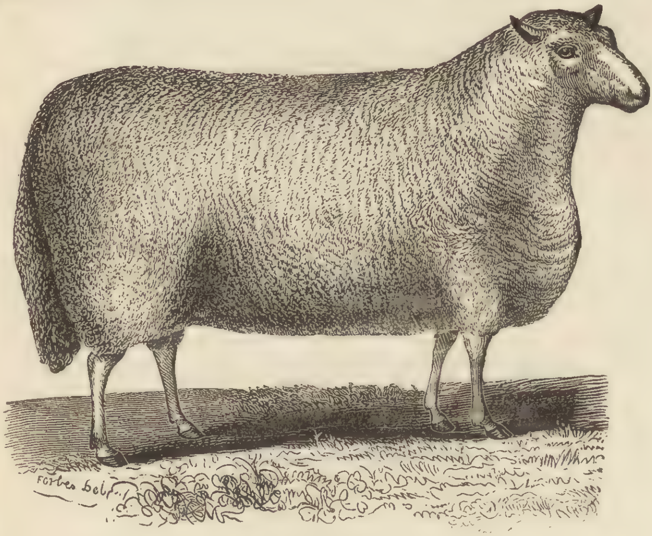


Fig. 112—Cheviot Ram.

In a flock belonging to Geo. Campbell of Vermont, after very thorough washing, they were found to average 4 lbs. 5½ ozs. per head.

Cheviot Ram—(Fig. 112.)—Since much of the profit of sheep-raising in some places arises from the sale of mutton and lambs, more attention is directed to the larger, coarse-wool breeds. Their crosses with some of the hardier Merinos have proved profitable animals. The Cheviot breed does not appear to be much known in this country; yet their success on the cold mountains where they have been chiefly raised, induces the belief that they are worthy of more attention.

Fig. 113—French Merino Ewes.

Fig. 114—French Merino Ram.

French Merino Sheep and Ram.—The annexed cuts represent imported French Merinos, belonging to G. Campbell of Vermont. The ewes (fig. 113) weighed about 125 pounds each. Their fleece averaged about 12 pounds each. The ram (fig. 114) when figured, was three years old, and weighed the winter previously 261 pounds. His fleece was one year old, and after losing a portion on the sea voyage, sheared 20 lbs. 12 ozs.

Fig. 115—Portuguese Swine.

Portuguese Swine—(Fig. 115.)—The Portuguese much resemble the Chinese, except in color. Several importations have been made; and among the rest those belonging to A. E. Beach of New-York, from which the engraving is made, are of a dark red.

Fig. 116—Chinese Swine.

Chinese Swine—(Fig. 116.)—There are several distinct varieties of swine in China, some of which have a remarkable tendency to fatten, and have been the source of the principal improvement which has been made in the aboriginal stocks of Great Britain, from whence most of our stock has been derived. The Chinese swine are frequently very prolific, producing from twelve to fifteen pigs at a litter. One of those herewith delineated, was suckling thirteen pigs when the portraits were taken.

[In previous numbers of the Register, portraits have been presented of Short-horn, Devon, Hereford, Ayrshire and Alderney cattle; of Black Hawk and the English cart horses; of South Down, Leicester, Spanish and French Merino Sheep; and of Suffolk, Berkshire, Essex and "Land-pike" pigs—also several articles on their care and management, and on the prevention and cure of the diseases to which they are most frequently liable.]

Grinding or Crushing Food.—Chemical experiments have proved that the outer skin of grain is nearly insoluble by the gastric juice of animals. Hence, when grain passes through them whole, it imparts but a small portion of nutriment to the animal. But if only broken before feeding, or by mastication, the whole of the kernel is digested, and the skin only passes away.

EXPERIMENTS IN FEEDING ANIMALS.

Selling Corn in Pork.—If the farmer can get as much for his corn by first making it into pork, as by a sale of the grain itself, it is best to convert it to flesh, provided the manure is worth more for his land, than the labor of feeding. Hunt's Merchant's Magazine gives several experiments, showing the cost of pork-making. In one, 100 hogs were fed 100 days with as much corn as they could eat, and each bushel of corn gave an increase of 10 1-2 lbs. of animal, or 8 2-5 lbs. of dressed pork; or in other words, 1 lb. of pork required 5 3-4 lbs. of corn. In another experiment with 58 hogs, 1 lb. of pork required 6 1-2 lbs. of corn. The corn was fed in the ear.

According to these experiments, 3 cents per pound for pork is the same as 25 cents per bushel for corn; 4 cents per pound is 33 cents for corn; 5 cents per pound is 42 cents per bushel; and 6 cents per pound is 50 cents for corn. This would not *pay* in many places, without fattening hogs mainly on apples, which many farmers do at a great profit.

A smaller experiment was made with *cooked meal* which required a little less than four pounds for a pound of pork. (We know several farmers who *estimate* cooked food as twice the value of unground grain.) Different breeds would doubtless give quite different results.

We want many experiments of this kind—the knowledge thus acquired would be worth in practice many times its cost. Why do farmers keep blundering on in the fog of guess-work?

Another Experiment with Feeding Hogs.—Six hogs were shut up to fatten the first day of autumn; they were fed one month on 29 bushels of corn (58 bush. ears) and increased 386 lbs., or 12 2-3 lbs. gross weight, for each bushel of corn. The next month they were fed 68 bushels, and gained 336 lbs., or 10 lbs. per bushel. The last month they consumed 56 bushels and increased 272 lbs., or nearly 10 lbs. per bushel. This result was quite similar to the first-mentioned above, and this may be taken as about the average results of judicious feeding in the ear.

Food Consumed by Cows.—Prof. S. W. Johnson says that according to experiments made in Bavaria, cows to give the greatest quantity of milk, must consume daily one-thirtieth of their live weight in hay, or other food of equivalent value. More food increases flesh and fat, and less diminishes milk.

Rules for Fattening Animals.—1. Let them have good, clean, nourishing food. 2. Feed them with the utmost regularity as to time—for "hope deferred" wastes flesh by fretting. 3. Feed often, and never give a surplus. 4. Let the pen or stable be kept clean and sweet—dirt or filth is always adverse to thrift. 5. Let the air be fresh and pure. 6. The water they drink must be pure. 7. They should have *rest* most of the

time, and only very gentle exercise. 8. Keep them tranquil, and avoid fright and anxiety. If all these are carefully observed, they will make a vast difference in results.

RURAL ECONOMY.

Rules for Constructing Horse Stables.—1. For good ventilation, and to prevent horses striking their heads in any case, against the roof or floor above, the height should not be less than nine feet. 2. From the manger backwards, the floor should descend at least one inch in four feet. 3. Each stall should be five and a half feet wide, and fourteen feet long including the whole space behind the horse. 4. The partitions, made of strong plank, and scantling frame, should extend back eight feet, and be seven feet high at the head, and five feet at the rear.

Simple Questions and Simple Answers.—Is there any farmer who never used an old rusty hoe, and a smooth and bright one, without observing the great difference in the amount of work he conld do by each? Two hours more each day for the bright one? This would be five days for every month of hoeing. What does this fact teach? It teaches the importance of keeping tools in their places, well sheltered from the weather, and to have them brushed clean and bright whenever they are put away.

Corn Shocks.—A great deal of good corn-fodder is spoiled, because the shocks are not well bound together, and storms soon throw them down. Large shocks of the husked stalks may be firmly secured, by first bringing them firmly together with a rope, attached to a simple contrivance shown in the annexed figure. A small piece of board, A, has three holes bored through it; and a sharp, round, and tapering stick, B, has a crank attached. One end of a ten-foot rope, is then passed through one hole and fastened to the crank; the board is placed against the shock, the sharp stick thrust through into the shock, and the rope passed around the shock, and hooked on an iron hook at the other hole, as shown in C. A few turns winds up the rope, binding the whole closely together, when a band is placed around, and the rope unhooked for the next.

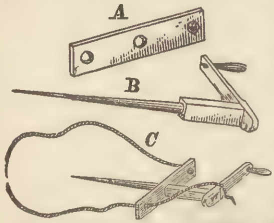


Fig. 117—Corn-shock Binder.

Animals in Winter.—Farmers do not sufficiently sub-divide their yards in winter. Large and small animals are turned in promiscuously together, and as every farmer knows, the larger ones are very ferocious and domineering towards those much inferior, but careful not to provoke

the wrath of such as are nearly equal. Turn those together which are of similar size, and they will be more quiet all round. Calves generally are too much neglected,—and come out small and puny in spring. A good manager has constructed a spacious stable for calves in one of his sheds, moderately lighted, and well sheltered from all currents of wind. This apartment is kept clean, the calves fed on good hay, and supplied with good water. They present a very different appearance from other calves in spring.

Filling Ice-Houses.—A good deal of labor is sometimes lost, by not adopting the easiest mode of lifting the ice out of the water. After the blocks are sawn in the water, (which should be done by accurate measurement, so that all may pile up solid, like hewn stone, and leave no crevices,) they are very easily and quickly drawn out by means of a light, stiff plank, having a cleat across one end. This plank is thrust with its cleat end into the water, and under the block of ice; the cleat holds it, when the plank is drawn forward, and thus lifts it out.

Fig 118—Drawing Ice out of Water for Ice-house.

To Build Common Rail Fence.—Begin at the bottom of all hills or ascents, and build up—this will make the fence stand much better against the wind and all disturbing causes.

Planting Timber Land.—It is said that thirty years, at the present rate of cutting and slashing, will sweep off all trees fit for lumber east of the Mississippi. We must raise young timber. If we allow second growth to spring up, ten acres of fertile land, *well managed*, will supply a family with fuel: five more will fence a medium farm. On poorer soils, more will be required. It is to be cut once in twenty years.

But in spontaneous growth, we have not a choice of the best timber—we have to take it as it comes, good and bad. It is better, also, to plant *in rows*, and then a wagon may be driven easily through any part, in drawing out the timber. Plant alternate rows of locust, chestnut, and European larch. If one does not happen to succeed well, the others will have a chance, and the land will still be occupied.

By planting in rows and cultivating the trees while young, they will grow five to ten times as fast. They may alternate with hills of potatoes or beans on the start, and two rows of potatoes between each row of trees. The next two years the same, or keep the ground clean, mellow, and bare. Then corn, if the trees don't shade all the ground, as they probably will.

Locust seed will not grow, unless boiling water is poured on, and allowed to remain some hours. The swollen seed will grow; the rest must be

scalded again. Chestnuts will not grow if the shell becomes dry—keep them moist from the first and they will. Both should be planted in hills like corn, and thinned out, but not transplanted. European larch may be had cheaply from English nurseries.

SHELTER.—There is one truth which every farmer who ever winters a herd of any kind of animals, should fully appreciate,—and that is, that "*Shelter is cheaper than fodder.*" Exposed animals will consume a third more food, and come out in the spring in worse condition. The loss of animals by death in wintering, when suffering from all the severities of piercing winds, drifting snows, and cutting sleet, is sometimes greater in two or three years than the cost of substantial and comfortable buildings for protection; and the loss of fodder consumed in any case, would in a few years pay for their erection.

DOUBLE-MINDED FARMERS.—One great principle for success in business, is learning a trade well and then sticking to it. It requires a long time to know everything connected with successful business. An acquaintance, a seed-dealer, stated that for the first five years, he could not ascertain that he made anything. But he was learning. Before ten years, he was clearing five thousand dollars per year. Another was doing well in manufacturing ropes. But he was unstable in mind, and although his friends advised him to "*hang to the ropes,*" he was not getting rich fast enough, and he meddled with business he had not learned sufficiently, bought a mill, bought grain, and then broke a bank by his large failure. Some farmers come to the conclusion that *cows* are the most profitable; purchase animals, erect buildings, and begin well. But being new business, they do not succeed as they expected; they might, if they would stick to it. The next year they sell their dairy, and buy sheep. The price of wool is low that year; and they hear that much money has been made by raising tobacco. Thus they go on, changing from one thing to another, and never succeeding in any. Stick to your business.

TO MAKE HENS LAY IN WINTER.—Provide,

1. A comfortable roost;
2. Plenty of sand, gravel and ashes, *dry*, to play in;
3. A box of lime;
4. Boiled meat, chopped fine, every two or three days;
5. Corn and oats, best if boiled tender;
6. All the crumbs and potato parings;
7. Water, not cold, or blood warm.

This treatment has proved quite successful—and hens which, without it, gave no eggs, with it immediately laid one each, on an average, every two days.

FEEDING BEES.—Honey in the comb is best for this purpose; next, strained honey, if not too old, poured over empty comb; next two pounds of sugar with one pint of warer, heated to boiling to remove the scum,

and then poured over comb. To feed, take them into a room or dry cellar, turn the hive bottom up, cover it with a porous cloth to admit air, then gently move the cloth and place the comb within, and the bees will feed from it. Once a week, turn the hive gently back again for twelve hours, for the bees to work out dead bees, &c.

Preparation of Hams.—B. P. Johnson, of the N. Y. State Agricultural Society, found on a recent visit to Maryland, hams far superior to any he had ever met with in New-York—and received the following account of the mode of preparing. We can fully endorse all that is said in favor of this mode of preparing and cooking, having used substantially this mode for many years:—

To every 100 lbs. of hams, take 8 lbs. of fine salt, 5 ounces of saltpetre, 5 ounces of brown sugar, half a pint of molasses, and an ounce of African red pepper; first sift and powder the saltpetre, and pass the salt and sugar under a rolling pin, and then mix all together. Rub this well on the skin side, and slightly on the flesh side, putting as much as possible into the hock. Place them on a platform for six weeks. [We repeat the rubbing two or three times.] Smoke with hickory wood. If the hams are large, they must be boiled six hours—if small, or if but half a one is taken at a time, four or five hours will do. Keep the pot filled, supplying evaporation with hot water. [The directions state that after the first boiling, the pot should be partially withdrawn, so as to allow simmering merely, but we do not see any special advantage, as *simmering* and *rapidly boiling* water are both at 212° of the thermometer.]

DOMESTIC ECONOMY.

Cement for Broken China.—Stir plaster of Paris into a *thick* solution of gum arabic, till it becomes a viscous paste. Apply it with a brush to the fractured edges, and draw the parts closely together. In three days, more or less according to dryness and temperature of the air, it will be perfectly dry, and the article cannot be broken in the same place. It is white, and does not show.

To Make Sticking Salve.—Three pounds rosin, half a pound mutton tallow, half a pound of beeswax, and a table-spoonful of sulphur; melted, poured into cold water, and worked and pulled an hour.

To Prevent Cistern Pumps Freezing.—Cistern pumps often are made to bring up the water through curved or inclined lead pipe, so as to conduct it to any desired place in the kitchen. They usually have a valve to open by a stroke of the pump-handle, and let all the water down again, so as not to freeze. But careless hired girls frequently omit this, and the lead pipe is filled with ice, which often splits the lead and spoils the

pump. A safer way, therefore, is to place a small splinter of wood under the lower valve, to let the water leak out in about five minutes, and drain the pump. This is to remain only during winter. The best pumps are now made so as to *screw off* the base in a few seconds, laying the lower valve to view. If pump tubes become actually filled with ice, they may be quickly thawed by pouring hot water *directly* on the ice, through a small lead or other tube, which must settle as fast as the ice thaws. Ice may be thus thawed a foot per minute—but without this tube it could not be thawed in a whole day, for the hot water being lightest, remains at the top.

To Repel Flies.—Paint the walls with *laurel oil.* It will keep flies off of picture frames, &c.

To Knit Heels.—To knit the heels of socks double, so that they may thus last twice as long as otherwise, skip every alternate stitch on the wrong side, and knit all on the right. This will make it double, like that of a double-ply ingrain carpet.

A Rat-trap.—A writer in Moore's *Rural*, says he fills a swill-barrel full of good swill—the rats soon learn to come and eat. After a few days, six or eight inches of the swill are dipped out, when they still find their way into the barrel, *but not out.* Sixteen rats were thus caught in one night.

To Catch Owls.—Set a steel-trap on the top of a pole, near the hen-roost, and he will certainly be caught.

Leaking Houses.—There are very few common houses built of wood, that will not after a long season of drought, leak badly at some places, when heavy rains occur. The best cement for stopping all cracks or openings where the rains enter, is a mixture of sand and white lead paint.

Keeping Poultry.—Judge Buel kept poultry in winter more than two months in a perfect state of preservation, by filling them after they were dressed, with powdered charcoal, and then hanging them in an airy loft.

Cure for Stings and Bites.—Venomous bites and stings generally, owe their virulence to a poisonous acid. Wet saleratus will cure a bee sting in a few minutes, and a poultice of wet ashes has quickly cured a rattle-snake bite.

Door Latches will work easily and with little noise, by touching them lightly once a week with a little oil or tallow.

Soot in Chimneys, by taking fire, and dropping burning cinders on dry shingle roofs, causes many conflagrations. Most fires in the country originate in this way. Be particular to clean or burn out soot at least once a year, when the roof is wet.

Friction Matches should never be left where mice can get them—they have sometimes carried them in among their nests of shavings and papers, and slight causes have set them on fire and burned houses. A lady was

nearly burned to death, by the fire from a match which had been carelessly thrown on the floor, and which she fired by treading on it.

POSTAGE STAMPS, to stick well, should be wet on their face, *after they are applied*—this effectually prevents the corners from curling up.

TO KEEP HAMS IN SUMMER.—Wrap each in paper, pack them in a barrel, filling all the interstices between them so that they may not touch or come in contact with each other. Then cover the barrel tight to exclude insects, and keep in a dry place, and as cool as convenient.

APPLICATION OF KNOWLEDGE.—A very valuable pocket-knife was once dropped into a twenty-feet well, half full of water. "How shall we get it out? Shall we have to draw all the water from the well?" The writer proposed to use a strong horse-shoe magnet, near by, suspended to a cord. "But we can't see where to lower the magnet to, so as to touch the knife?" "Throw the sun's rays down on the bottom of the well by a looking-glass," was the second answer. It was done, the knife rendered visible from the top of the well, the magnet brought into contact, and the knife brought up—all being accomplished in a minute of time.

ANOTHER EXAMPLE.—The two parts of a pump bucket screwed together, were to be separated in repairing it, so as to introduce a new leather packing. But it was old, rusty, and firm. and the force of three stout men, with levers affixed to it, could not start it a hair's breadth. But what strength could not do, brains did. The outer part, or socket, (into which the other was screwed,) was heated, and the inner kept cold —the heat expanded it, made it larger, and a force of less than ten pounds separated the two portions.

Ground stoppers sometimes are fast in bottles, and hard to move—the heat of the fingers, in working at them, renders them still more so—but if the neck of the bottle is warmed, (by a cloth in hot water, by hot ashes, &c.,) the stopper will loosen immediately.

Nuts on large screws are sometimes in a similar *fix*, and may be removed in the same way. A nut required to keep its place firmly, if first heated may be fastened on more securely, and with less injury to the thread, than by the most forcible screwing.

TO MEND A CHAIN PUMP WITHOUT TAKING IT UP.—When the chain breaks, uncover the well and hook up one end of the chain. Tie a long cord to this end, and the other end of the cord to a large cork. Drop the chain with its cork down the pump tube, when, as soon as the cork passes the lower end, it will pop up to the surface of the water in the well. Draw it up and with it the cord, and with the cord the chain, when the chain is readily united, and the circuit made again.

DISH-WATER AND SOAP-SUDS, instead of being appropriated to the formation of an interesting puddle at the kitchen door, should be poured at the roots of young fruit trees, raspberry and currant bushes, and will accelerate their growth and augment the size of the fruit.

STEAMER FOR COOKING FEED.

A western correspondent, remote from facilities for procuring boilers and cooking apparatus from the east, inquires for a cheap and efficient contrivance that may be manufactured nearer home.

A cheap and good boiler may be made of two-inch plank, made into a box, halved together at the corners, and secured by nailing on sheet-iron braces. This box should be of such a size that a single sheet of large sheet-iron may form the bottom, by projecting two inches on each side, so as to be bent up and nailed against the sides of the box. This is set

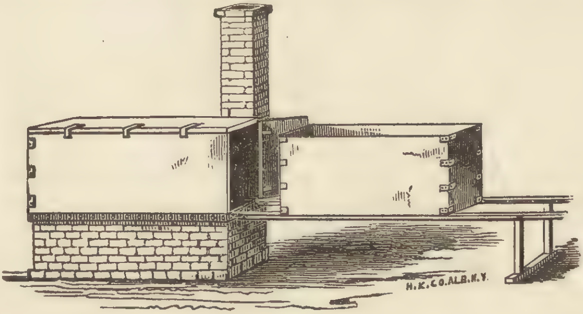


Fig. 119—Steam Boiler.

on brick-work, forming a place for the fire beneath; the fire striking against the sheet-iron only, and the flue far enough off to secure the wooden part of the box from burning. A board, fitting the inside of the box horizontally, has cleats nailed across the under side, so as to keep it about three inches above the sheet-iron bottom; and these cleats are hollowed up in the middle, so as to rest only on their ends. The board has several holes bored through for the passage of the steam. About three inches of water are poured into the box, the roots or other substance are then placed upon the board, till filled; the tight lid is buttoned down, and heat applied beneath till the steaming is completed. A box of greater length may be used, the sheet-iron covering only a part of the bottom, provided sufficient care is taken to make it tight where joining the wooden portions of the bottom, the iron part only, as a matter of course, being over fire-place. Or, two sheets of iron may be joined together by lapping like the joints of stove-pipe, and the box thus made double the capacity. The fire-place will economize the fuel in the best manner, if built so that a *thin sheet* of flame will pass beneath the whole bottom, like that in Mott's furnace.

A steamer was described many years ago in one of the earlier volumes

of The Cultivator, which possesses several important advantages on account of the ease with which its contents are transferred from one place to another. It is represented in figure 119, where the box on the left is the boiler set on the brick fire-place as already described, but with the flue placed at *one side*, so that a door may open at the end. The right hand box is placed on small wheels or rollers, which run on horizontal rails, running into the boiler, where it is enclosed by the tight door. This box (with holes bored in its bottom,) is run along the rails under the bin of roots, and is quickly filled through a trap-door. It is then run into the boiler, the door closed, and heat applied. The three inches of water is quickly made to boil, and the steaming process goes on rapidly. When completed, the box with its cooked contents is run out (by hooking into a ring) on the rails, and an iron pin withdrawn which opens its bottom downwards, and discharges its contents into another box placed beneath, and standing beside the feeding-trough. If the rails are of some length, several such boxes may be filled successively, and allowed to cool. No safety-valve is required, as a sufficient quantity of waste steam will escape at the door, even if *list* is applied around its edges to make it tight. If necessary, a stop-cock or two may be inserted into the lower part of the boiler, to show the amount of water, as in the common boilers of a steam engine. The door is set about four inches higher than the bottom of the boiler, to allow space for water.

We cannot state from experience the value of this apparatus, but if there is no drawback, it must save a great amount of labor in handling roots and other food for cattle, which, being daily performed, constitutes a large item in a year.

Keeping Potatoes in Winter.—Potatoes spoil in winter, if buried, from three causes. First and greatest, want of ventilation. Secondly, and nearly allied, dampness. Thirdly, and more rare, freezing. Farmers find most of their potatoes spoiled at the top of the heap, where they suppose they became frozen; but this is not the usual cause; the damp, foul steamy air ascended there, and could not escape, and this spoiled them. A hole made in the top, with a crowbar, and closed with a wisp of straw, would have allowed egress to the confined air, and saved the potatoes.

The best way to secure potatoes out-doors, is to make large heaps, say 50 or 60 bushels; see that they are dry and clean, by digging before wet weather comes on; cover them all over with *one foot* of *packed straw*, and three inches of earth. The straw will prevent dampness, and the few inches of earth will favor ventilation. A farmer who raises many potatoes, and practices this mode, does not lose a peck, on an average, in 50 bushels.

WEIGHT OF GRAIN

In a former number of the Register, in a large number of tables of *Weights and Measures*, a few lines were devoted to the weights of different kinds of grain per bushel. These were furnished by a high standard authority, giving briefly the *average* number of pounds per bushel in various parts of the country, as nearly as could be furnished in so small a space. Since that time, legislative enactments in some of the States have materially changed a few of the weights, and in order to give the best information in our power at the present time, we copy the following table from the Genesee Farmer of 1857, the weights being furnished a firm in Rochester by the Secretaries of the different States—in which table we have made such alterations as the last law of New-York, recently passed, requires. The letter *m* indicates sold by measure.

ARTICLES.	New-York.	Ohio.	Pennsylvania.	Indiana.	Wisconsin.	Iowa.	Illinois.	Michigan.	Connecticut.	Massachusetts.	Rhode-Island.	Kentucky.	New-Jersey.	Vermont.	Missouri.	Canada.
Wheat, lb.,	60	60	60	60	60	60	60	60	56	60	..	60	60	60	60	60
Rye,	56	56	56	56	56	56	54	56	56	56	..	56	56	56	56	56
Corn,	58	56	56	56	56	56	56	56	56	56	..	56	56	56	52	56
Oats,	32	32	32	32	32	35	32	32	28	30	..	33	30	32	m	34
Barley,	48	48	47	48	48	48	44	48	..	46	..	48	48	46	m	48
Buckwheat,	48	..	48	50	42	52	40	42	45	46	..	52	50	46	m	48
Clover seed,	60	64	..	60	60	60	..	60	..	..	..	60	64	..	m	60
Timothy seed,	44	42	..	45	..	45	..	m	..	m	..	45	..	..	m	48
Flax seed,	55	56	..	56	..	56	..	m	..	m	..	56	55	..	m	56
Hemp seed,	44	..	..	44	..	44	..	..	..	..	..	..	..	..	..	..
Blue-grass seed,	14	..	..	14	..	14	..	..	..	..	..	..	..	..	..	..
Apples, dried,	22	25	..	..	28	24	..	28	..	..	..	..	..	..	..	22
Peaches, dried,	32	33	..	..	28	33	..	28	..	..	..	..	..	..	..	22
Coarse Salt,	56	50	85	50	..	50	..	..		70	..	50	..	..	50	56
Fine Salt,	56	50	62	50	..	50	..	..	..	70	..	50	..	..	50	56
Potatoes,	60	..	..	60	..	60	..	..	60	60	60	..	..	60	..	..
Peas,	60	..	..	..	..	..	..	..	..	60	..	..	..	..	..	60
Beans,	62	56	..	60	..	60	..	..	..	60	..	60	..	..	..	60
Castor Beans,	46	..	..	46	..	46	..	..	..	..	..	..	..	..	..	..
Onions,	57	..	..	57	..	57	..	..	..	50	50	..	..	..	..	..
Corn Meal,	..	..	..	50	..	..	..	..	..	..	50	..	..	..	..	..
Mineral Coal,	..	..	..	70	..	..	..	..	..	..	..	..	..	..	..	..

A law of New-York, in force at the present time, adopts the United States *bushel of measure*, as already given in the Register for 1857, viz: 2150.42 cubic inches per bushel, 1075.21 half bushel; and the wine gallon, 231 cubic inches.

To reduce cubic feet to bushels, struck measure, divide the cubic feet by 56 and multiply by 45.

VARIOUS REMEDIES, TREATMENT, &c.,

RECOMMENDED FOR TRIAL.

Relieving Choked Cattle.—It is said that pouring into the throat half a pint, more or less, of sweet oil, (or lamp oil,) will so lubricate the obstruction, that rubbing the throat briskly outside with the hand will soon remove it—sliding it up or down according to its position. In any case, the oil is a useful auxiliary to other means.

Feeding Pumpkin Seed to Cattle.—It is asserted by some good farmers, that pumpkin seeds have a certain specific effect on cows, causing them to dry up their milk; and that when the seeds are taken out before feeding, it will be found they yield a larger quantity.

Garget or Inflamed Udder in Cows.—It is stated on good authority, that whenever this disease is caused by a cold, a few drops of *aconite* in solution, will soon effect a cure. It is dropped into water, and a piece of bread then soaked in it, and applied.

Fattening Lambs.—A correspondenf of the Maine Farmer, says that lambs will soon learn to eat oats, if left before them, at about three weeks of age; and that it will cause them to grow and fatten rapidly—more so than by any feeding to the dams. Two boards are nailed together for a trough, and short boards nailed on the end, so as to raise them about six inches high—in this the oats are placed. The troughs are in a yard or barn, to which openings are made just large enough for the lambs to pass, but too small for the sheep.

Stretches in Sheep.—An eminent and skillful manager of sheep, says that he seldom fails to cure sheep of this disease in a few minutes, by placing a spoonful of tar in the mouth, and holding it shut till the tar melts and runs down. Lard and castor oil produce a slower and less certain effect.

Driving off the Rats.—The Farm Journal gives an experiment performed with chlorine gas. A dish of manganese and muriatic acid, for producing this gas, was placed under the garret floor, and on the lathing below it, the floor board being replaced. The gas, being heavy, descended in every direction between plastering and walls, and being exceedingly pungent, produced a "great sensation." "All night long, it would seem as if Bedlam had broken loose between the partitions." They decamped, big and little, and stayed away three months. Chloride is a poisonous gas, unless in minute portions, and great caution is required not to breathe much of it. It should be well confined within the walls. It is an admirable purifier, at least. The best rat trap or rat poison we ever found, is a good cat.

Heaves in Horses.—Well cured corn-stalks, cut before frost, are the best fodder for horses that have the heaves. Cases taken in time, have been ultimately cured by constantly feeding on them. Hay, cut fine, and

wet before feeding, will greatly alleviate all symptoms of heaves; and even in old and incurable cases, the disease will be often *suspended* while horses are thus fed.

Over-reaching Horses.—A writer in the N. E. Farmer, who is a black-smith, cures over-reaching horses, and increases their trotting speed fifteen or twenty seconds per mile, by the following mode of shoeing, which increases the motion of the forward feet and retards the motion of the hind ones. He makes the toe-caulks very low, standing a little under, and the shoes set as far backward as convenient, on the forward feet, with high heel-caulks, so as to let them roll over as soon as possible. On the hind feet, the heel-caulk is low and the toe-caulk high and projecting forward. Horses shod thus, travel clean, with no click.

Repelling Flies.—A writer in the Farm Journal pours two pails (24 quarts) of boiling water, on five pounds each of walnut and tobacco leaves (refuse tobacco), and washes his horses, oxen and cows with this decoction—when dry, he rubs the horses down with walnut leaves. He affirms this will repel flies for two weeks (if not washed off by rains, we suppose.) A decoction of wormwood is said to have the same effect—and probably many other plants would be equally efficacious.

ROOT CROPS.

Storing Ruta Bagas.—These roots heat easily, and they require most thorough ventilation. Next, to be kept as cool as practicable, without freezing—a little frost will not hurt them, if thawed very gradually. If stored in a cellar, they must not be placed on the bottom of the cellar, but kept a foot above, on a coarse wooden grate, which may be made of rails. This will admit air freely. If heated, they become pithy and comparatively worthless.

If kept out-doors, they should be placed in *ridges*, not over three feet wide, and as steep as they will pile, and as long as convenient. Cover well with straw, then with a few inches of earth—in the northern States, six inches will do. Pat the earth smooth with a spade, to drain off rains. Then make a hole with a stake or crowbar, every six feet, and put in a wisp of straw—this allows ventilation.

Carrots in Succession.—In some parts of Massachusetts, four or five successive crops of carrots are taken from the same land, without a diminished product. The editor of the New-England Farmer says he has raised four successive crops, with a gradual increase. All crops must exhaust land more or less, unless a part or all is left on the land; but in this instance, it appears that the annual manuring imparted more fertility than the crop took away.

CHEAP FENCES.

In most of the newer portions of the country, the old-fashioned zig-zag rail fences still prevail, and where timber is abundant, do not cost one-third the amount required for good post and board fence. Many of them are made wholly of rails, without any protection at the corners, and are consequently easily thrown down by cattle, colts, and the wind. A firmer fence consists in the addition of stakes and riders; but the stakes projecting two feet beyond the fence, the whole occupies a strip of land at least ten feet wide. Placing the stakes *upright* at the corners, and connecting the two opposite ones near the top by means of a loop of annealed or small telegraph wire, is a great improvement, occupying but little more than half the ground required for the former. Another modification, equally efficient and as saving of land, consists in placing the riders, (for which long poles are best,) in a straight line on the top and at the center of the fence, and then placing upright stakes in each inner corner between the rider and the fence, the lower end merely resting on the ground, and the other wedging closely between the top rail and riders.

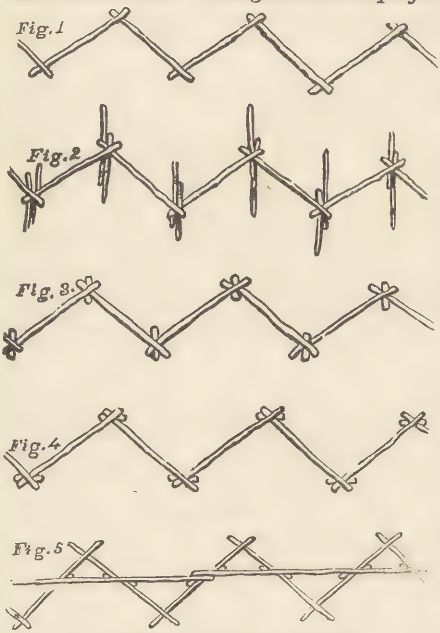


Fig 120—Ground Plans of Fences.

The accompanying figures, showing a ground plan of each fence, will serve to make their construction plainer, and to exhibit their several advantages.

Fig. 1 represents the simple zigzag fence, as seen on careless farmers' grounds, without any stakes.

Fig. 2 is the common "staked and ridered" fence, somewhat substantial, but occupying too broad a strip of land.

Fig. 3 is a better arrangement, with upright stakes placed at the

opposite corners, and the two connected and held closely to their places by a loop of annealed wire.

Fig. 4 is similar to the last, but is better, inasmuch as the stakes are placed in the *acute* corners, and therefore maintain their places better, and brace the fence more firmly than if placed in the *obtuse* angles, as in fig. 3.

In fig. 5 the bracing is still more perfect, but the fence has not the neat appearance of fig. 4. In the two last, the stakes need not enter the ground, but may rest merely upon the surface, and hence short pieces of timber, broken rails, or any sticks five feet long will answer, provided they are connected by wire about two-thirds or three-fourths of the height of the fence. These two modifications, then, are more economical in construction as well as in the length of the stakes, no holes being required for the insertion of their lower ends. Less strength of wire is needed for these, as the stakes are more securely held in the acute angles.

VENTILATION.

Some of our readers may recollect the speech of the old-fashioned deacon, on the occasion of the introduction of a stove into the place of worship, after the congregation had endured the unsoftened cold of winter from time immemorial. They had always done without a fire in winter, until some of the younger portion of the church, with their new-fangled notions, out-voted the conservatives, and a stove was introduced. After the lapse of a few weeks, the deacon requested the congregation at the close of the services, to remain in their seats, as he had important business to lay before them. The subject of the stove was then broached. "If," said he, in conclusion, "you are resolved to keep the stove in the church, then pray get one large enough to warm the whole house; for as it now is, the stove is only large enough to drive all the cold back into the remote parts of the house, where myself and others sit, and we are now colder than before." This remark was considered by some as especially absurd; but after all, he was right, although the rationale was rather fallacious.

One fact to illustrate our meaning. We have gone into a room in winter where there was no fire, and where every door and window appeared to shut so closely that not the least current could be perceived from any crevice. A fire has then been built in the fire-place, and immediately the shrill singing of air currents entering crevices before unknown, showed that the rapid draught up the chimney required supply from without, and that the cold air was rapidly rushing in for this purpose. Of course, near these window currents, it must be colder than before. Precisely in the same way, the deacon above spoken of, found that the cold currents

from without had increased by the introduction of the stove; the draught of the fire requiring a constant supply of air.

This fact furnishes some important suggestions on the subject of ventilation. There is no question that the air in many of our rooms in winter, becomes close, and unwholesome to breathe; but where there is a strong draught, either up the throat of a fire-place or through the pipe of a stove, the circulation is quite sufficient to maintain good fresh air for all the ordinary purposes of breathing, *provided the circulation is in the right direction.* The air rushes in through window crevices, and passes directly towards the fire. These entering currents *immediately descend*, because, first, they are much heavier than the air of the room. The experiments of Gay Lussac proved that air a few degrees below freezing, (about 24° Fah.,) is about one-tenth heavier than air in a room at 68°. These cold streams must of course, as soon as they enter, fall like streams of water towards the floor. They immediately descend, because, secondly, the air current which feeds the fire must go as low as the fire, which is generally within a foot or two of the floor Fig. 121 exhibits those descending currents.

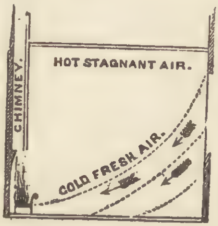


Fig. 121.

For these reasons, all the cold air of a room, and all the fresh air, surrounds only the feet and legs of the occupants. All in the upper portions is *stagnant*, and has no means of becoming purified. The head is thus kept *hot*, and the feet *cold;* foul air is fed to the lungs which ought to have fresh, and fresh cool air is kept around the feet. where its purity is useless, and its coldness detrimental to health and comfort. Every thing is exactly wrong, although there is enough of fresh air pouring into the room for all healthy breathing purposes, and enough of combustion going on to keep the room abundantly warm, if the heat were only properly distributed. Any one may satisfy himself on this point, by placing a thermometer at the floor and then at the ceiling, allowing fifteen minutes for it to settle. A difference of about *twenty degrees* between the two places at the same time, will generally be observed.

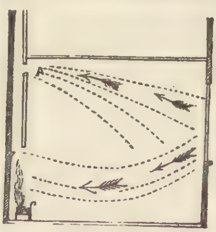


Fig. 122.

A partial remedy for this difficulty consists in placing a *Register* (*a*, fig. 122) in the chimney near the ceiling, to admit the escape of the foul upper air, at that place. This may be opened or closed at pleasure, according to the necessities of the case. Sometimes, for instance, the wind may drive the smoke downwards through this opening, and it will be important to keep it closed at all such times. Boynton and Richardson, of Broadway, New-York, manu-

facture a register for this purpose, which under ordinary circumstances remains open and admits the free escape of the air; but a downward current of air instantly closes it.

The chimney register affords, however, but a partial remedy. Although it serves to purify the upper air, it does not prevent the cold currents at the feet. We are inclined to think that some radical change in the construction of fire-places and stoves must be made before all the existing evils can be removed. A hot-air furnace obviates the defect completely, the hot air entering from below, and the air of the room passing out through all the crevices through which cold currents usually enter—(fig. 123.) But hot-air furnaces, if well made and durable, are costly and inconvenient to feed; they cost much to erect, and consume much fuel; and being placed in the basement or cellar, they are troublesome to superintend. In all farm houses which have no cellar kitchen, stoves are cheaper and far more convenient for small or moderate families; and we propose a new mode of setting them, to prevent the foot-bath of cold air referred to. Perhaps they will need to be constructed on purpose for the proposed arrangement. A space shall be left in the floor, so that *a hearth of brick may be laid some inches below the surface*—(fig. 124.) On this hearth the stove shall be directly set, without the intervention of legs. Just above this hearth, and below the floor, a wooden tube shall lead to the air outside the house, the portion next the stove being sheet-iron, and supplying air for combustion by passing directly into the stove. This will entirely obviate the necessity of cold streams of air from window cracks, to feed the fire. The air through another tube, or a portion of the same, may be admitted on different sides of the stove, and in contact with its lowest portions, for becoming heated to warm the room. This would also tend to obviate cold currents, because the fresh air coming in from below, would *pass out* through higher crevices, instead of *entering* them. The addition of a register near the ceiling would, if necessary, render the ventilation complete.

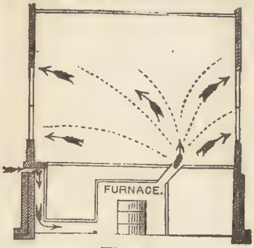


Fig. 123.

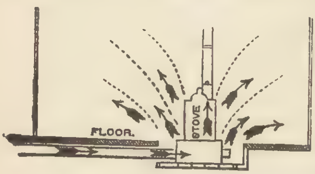


Fig. 124.

There would be another important advantage in this arrangement, on the score of economy. We have found by experiment, that a stove placed on a stand two feet high from the floor, required twice as much fuel as when placed down level with the floor, to render the room equally com-

fortable, so difficult is the descent of heated air. If, therefore, the stove were placed actually below the floor, the lower stratum of air next the floor, would be warmed with still greater facility.

This contrivance would afford the conveniences of a hot-air furnace already mentioned in this article, with less consumption of fuel, without unduly warming the cellar, and without the trouble of running down stairs every time the fire needs replenishing or regulating.

GOOD AND BAD MANAGEMENT.

We have sometimes thought that if farmers could see before them in all their distinctness, bad winter management on one hand, and good management on the other, side by side, it might serve as a stimulus to adopt the one and avoid the other.

The bad farmer throws his fodder on the ground, to be trodden under foot, or to be worked into the mud. The good farmer provides good but cheap racks, where all is saved.

The bad farmer allows his cattle and sheep to feed in the open fields, swept by every wintry tempest, or storm of sleet and snow. The good one provides good, clean, comfortable shelter, where the animals thrive and keep fat, and saves a large portion of the feed otherwise required to to keep up their animal heat

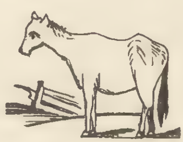


Fig. 125.

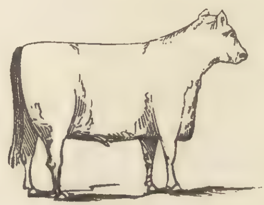


Fig. 126.

The poor farmer lets his calves run wherever the older cattle drive them, and by spring they look very much like fig. 125; the good farmer gives his calves the best chance of all his cattle, feeding them with meal and hay, and keeping them well stabled by night and properly sheltered by day, and in spring they look like fig. 126.

The bad manager permits his winter swine to procure their own lodging where they can best find it—in the corner of the barn-yard, in the manure heap, or under some transient pile of straw, exposed to rains and snow-drifts. The good manager provides a comfortable hog-house, and takes especial pains that they have good *dry* bedding, and that everything about them is kept *clean.*

THE

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

FARM MANAGEMENT.

IT is an interesting subject for inquiry, why different men with the same opportunities, variously fail or succeed, after years of equal labor. One will become rich, the other poor, on the same piece of land. One has had continued prosperity, and doubled or tripled his capital. The other has met with nothing but difficulty, misfortune, and "hard times." Instead of increasing his capital, he has become heavily involved in debt. His farm has run down and diminished in value. Altogether, he has come to the conclusion, that except with a *lucky few*, farming is a very hard, slavish, non-paying occupation.

SQUIRE SLIPSHOD'S BARN.

His successful neighbor on the other hand, has adopted a very different opinion. His crops are good, with scarcely an exception—his fences impenetrable — his fields without a weed—his farm-buildings and barn-yards, models of neatness—his cattle and sheep richly

marked with improved blood, in fine condition, and eagerly sought in market at high prices—his fruit trees are bending under their rich loads, and his dwelling and door-yard a gem of rural beauty. He has "not quite yet" concluded to give up the business of agriculture for feverish speculation, nor for the close, pent-up, and anxious life of city trade.

There is no lack of examples of both of these kinds of farming. The writer knows two men, now under fifty, who began active life in farming at about the same period—the first with very little property, the other with a beautiful hundred-acre farm. The first in less than twenty years had accumulated enough to buy seven hundred acres of the best land in that fertile region, and his average nett profits were between four and five thousand dollars a year. The other, with the fine hundred-acre patrimony, has worked equally hard, but he had not an acre left him, and was insolvent.

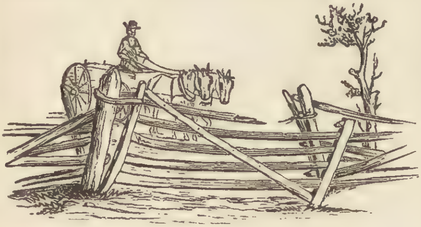
FARMER THRIFTY'S BARN, AS SEEN IN WINTER FROM HIS BACK DOOR.

Nearly all our readers are acquainted with two similar cases—those of ***Farmer Thrifty*** and *Squire Slipshod.* They will therefore recognize at once some of the accompanying roughly sketched portraits. Squire Slipshod's barn was originally the best in the neighborhood, but motives of economy have compelled him to omit some repairs he would have otherwise been glad to make —and he has become disheartened since he has discovered that boards and shingles become detached more easily than from the buildings of his neighbors. He has adopted a cheap fastening to his barn-doors, which, from its security, compels him to leave his wagons and tools outside. He especially wonders why Farmer Thrifty's barn and fence "keeps in such good order."

THE SQUIRE'S DOOR-YARD GATE.

The Squire's door-yard gate is the best gate on his premises; although the hinges are a little imperfect, causing it to diverge from the post at

the bottom—the only inconvenience of which results from the street pigs, which are constantly thrusting themselves through. The carriage-gate is scarcely inferior to the one just described, but possesses opposite qualities, gaping open at the top instead of the bottom.

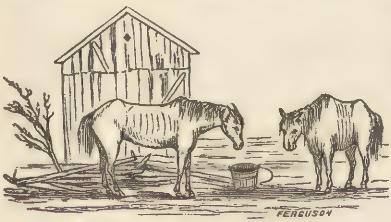

CARRIAGE GATE.

His mode of wintering tools and implements is not peculiar to him, but has some advantages, the main one being a saving of care and labor.

The Squire will not admit that his favorite horses are in any respect inferior to others, except it be that Farmer Thrifty's are a little fatter—which advantage is more than balanced by the high feeding and pampered keeping which the former has to give his team.

THE SQUIRE'S MODE OF WINTERING TOOLS AND IMPLEMENTS.

On two points he confesses to have been unlucky. One is in his young orchard, which has never flourished so well as that of his more successful neigbor, but he will not believe that this difference arises from anything else than *luck*, although he never gives his orchard any cultivation. Raising *pears* he regards as a humbug, as such varieties as *he* has planted, with his peculiar management, which he "thinks good enough," have given him specimens like this—(see fig. 9.) He



THE SQUIRE'S HORSES.

FARMER THRIFTY'S TEAM.

cannot, however, account for the good luck of his neighbor, whose entire crop was similar to fig. 10.

THE SQUIRE'S YOUNG ORCHARD. FARMER THRIFTY'S YOUNG ORCHARD.

The other point in which he admits his inferiority, is in his corn crop, from which, although his land is comparatively fertile, he obtains only about ten bushels of corn per acre, while the Farmer usually gets from fifty to seventy.

Fig. 9.

Fig. 10.

Now, the question very properly occurs, what should cause so great a difference in the farming of two neighbors—one always prosperous, the other as uniformly unsuccessful. The answer is an interesting and important one, namely, *difference in* MANAGEMENT. It is not the amount of labor expended, but the way in which this labor is directed. A man may work hard for days together, in carrying a hogshead of water, by repeated journeys, in an egg shell; or by efficient appliances it may be conveyed

the same distance in a few minutes. One may fatigue himself to no purpose by taking hold of the wrong end of the lever, while its proper use may overcome any resistance. It is this bad application of labor that

THE SQUIRE "UNLUCKY" WITH HIS CORN CROP.

causes heavy loss to hard-working, badly managing farmers. It is the object of these remarks to point out the causes of failure, and the requisites for success.

ORDER.—The good performance of a single operation, does not constitute a successful farmer. If he raises a hundred bushels of corn per acre, while his other crops do not pay cost; or if he sells a young colt for two hundred dollars, and sinks five hundred on other animals, he is a poor manager. The perfection of the art requires a skillful attention to *every part*—a proper arrangement *of the whole.* Everything must be done, not only in the best manner, and at the proper time, but with the most effective and economical expenditure of money. All must move on with clock-work regularity, without hurry or confusion, even at the most busy seasons of the year. A comprehensive plan of the whole business must be devised. In maturing such a plan, several important branches of the subject are to be carefully examined, under the various heads of Capital, Laying Out the Farm, Buildings, Choice of Implements, Selection of Animals, Rotation of Crops, and arrangement of operations in the Order of Time.

THE FARMER'S CORN.

CAPITAL.—The first requisite in all undertakings of magnitude, is to "count the cost." The man who commences a building, which to finish would cost ten thousand dollars, with a capital of only five thousand, is

as certainly ruined, as many farmers are, who, without counting the cost, commence on a scale to which their limited means are wholly inadequate. One of the greatest mistakes which young farmers make in this country, in their anxious wish for large possessions, is not only in purchasing more land than they can pay for, but in the actual expenditure of all their means, without leaving any even to *begin* the great work of farming. Hence, the farm continues for a long series of years poorly provided with stock, with implements, with manure, and with the necessary labor. From this heavy drawback on the profits of his land, the farmer is kept long in debt; the burthen of which not only disheartens him, but prevents that enterprise and energy which are essential to success. This is one fruitful reason why American agriculture is in many places in so low a state. A close observer, in traveling through the country, is thus enabled often to decide from the appearances of the buildings and premises of each occupant, whether he is in or out of debt.

In England—where the enormous taxes of different kinds imperiously compel the cultivator to farm well, or not farm at all—the indispensable necessity of a heavy capital to begin with, is fully understood. The man who merely *rents* a farm there, must possess as much to stock it and commence operations, as the man who *buys* and pays for a farm of equal size in the best parts of western New-York. The result is, that he is enabled to do everything in the best manner; he is not compelled to bring his goods prematurely to market, to supply his pressing wants; and by having ready money always at command, he can perform every operation at the very best season for product and economy, and make purchases, when necessary, at the most advantageous rate. The English farmer is thus able to pay an amount of tax, often more than the whole product of farms of equal extent in this country.

The importance of possessing the means of doing everything at exactly the right season, cannot be too highly appreciated. One or two illustrations may set this in a clearer light. Two farmers had each a crop of rutabagas, of an acre each. The first, by hoeing his crop early, while the weeds were only an inch high, accomplished the task with two days work, and the young plants then grew vigorously and yielded a heavy return. The second, being prevented by a deficiency of help, had to defer his hoeing one week, and then three days more, by rainy weather, making ten days in all. During this time the weeds had sprung up six to ten inches high, so as to require, instead of two days, no less than six days to hoe them; and so much was the growth of the crop checked at this early stage, that the owner had 150 bushels less on his acre, than the farmer who took time by the forelock. Another instance occurred with an intelligent farmer of this State, who raised two fields of oats on land of similar quality. One field was sown very early and well put in, and yielded a good profit. The other was delayed twelve days, and then

hurried; and although the crop was within two-thirds of the amount of the former, yet that difference was just the clear profit of the first crop; so that with the latter, the amount yielded only paid the expenses.

Admitting that the farm is already purchased and paid for, it becomes an object to know what else is needed, and at what cost, before cultivation is commenced. If the buildings and fences are what they should be, which is not often the case, little immediate outlay will be needed for them. But if not, then an estimate must be made of the intended improvements and the necessary sum allotted for them. These being all in order, the following items, requiring an expenditure of capital, will be required on a good farm of 100 acres of improved land, that being not far from the size of a large majority in this State. The estimate will of course vary considerably with circumstances, prices, &c.

Live Stock.—This will vary much with the character and quality of the land, its connection with market, &c., but the following is a fair average, for fertile land, and the prices an average for different years, although lower than they have recently been:—

3 horses, at $100, $300—1 yoke of oxen, $100,	$400
8 milch cows, $25, $200—10 steers, heifers and calves, $100,	300
20 pigs, $5, $100—100 sheep, $2, $200,	300
Poultry, &c.,	10
	$1010

Implements.—To farm *economically*, these must be of the best sort, especially those that are daily used. A plow, for instance, that saves only *one-eighth* of a team's strength, will save an hour a day, or more than *twelve* days (worth $24,) in a hundred—an amount, annually, that would be well worth paying freely for in the best plow. A simple hand-hoe,—so well made that it shall enable the laborer to do one hour's more work daily, will save twelve days in a hundred,—enough to pay for many of the best made implements of the kind. These examples are sufficient to show the importance of securing the best.

2 plows fitted for work, and 1 small do., $25—1 cultivator, $7,	$32.00
1 harrow, $10—1 roller, $10—1 seed planter, $15,	35.00
1 fanning mill, 1 straw cutter, $40—1 root slicer, $28,	68.00
1 farm wagon, 1 ox-cart, one-horse cart, with hay-racks, &c.,	180.00
Harness for three horses,	50.00
1 shovel, 1 spade, 2 manure-forks, 3 hay-forks, 1 pointed shovel, 1 grain shovel, 1 pick, 1 hammer, 1 wood saw, 1 turnip-hook, 2 ladders, 2 sheep-shears, 2 steelyards, (large and small,) 1 half-bushel measure, each $1,	20.00
1 horse-rake, $8—2 grain-cradles, 2 scythes, $12,	20.00
1 wheelbarrow, $5—1 maul and wedges, 2 axes, $6.50,	11.50
1 hay-knife, 1 ox-chain,	6.00
1 tape line, for measuring fields and crops,	2.00
1 grindstone, $3—1 crowbar, $2—1 sled and fixtures, $30,	35.00
Hand-hoes, hand-rakes, baskets, stable lantern, currycomb and brush, grain-bags, &c., say	15.00
	$474.50

The addition of a subsoil plow, sowing machine, mower and reaper, threshing machine, horse-power for sawing wood, cutting straw, &c.,

would more than double the amount, but young farmers may hire most of these during the earlier periods of their practice. A set of the simpler carpenter's tools, for repairing implements in rainy weather, would soon repay their cost.

Besides the preceding, the *seeds* for the various farm crops, would cost not less than $75; hired labor for one year, to do the work well, would probably be as much as $350; and food for maintaining all the domestic animals from the opening of spring until grass, and grain for horses till harvest, would not be less in value than $100; $525 in all.

For domestic animals,	$1010.00
" implements,	474.50
" seeds, food and labor,	525.00
	$2009.50

Thus, two thousand dollars are required the first year for stocking and conducting satisfactorily the operations of a hundred acres of good land—a much larger sum than is commonly supposed to be necessary, but none too much for the most profitable management. If this sum cannot be had, let the farmer purchase but fifty acres, so as to leave him a larger surplus of money, that he may till his land *well.*

Size of Farms.—The great loss from a superficial, skimming culture, has been fully shown. Take the corn-crop as an illustration. There are many whose yearly products per acre do not exceed 25 bushels. There are others, skilled in good management, who obtain as an average, not less than 80 bushels per acre. Now observe the difference in the profits of each. The first gets 250 bushels from ten acres. In doing this, he has to plow ten acres, harrow ten acres, mark out ten acres, find seed for ten acres, plant, cultivate, hoe, and cut up ten acres, besides paying the interest and taxes on this extent of land, worth about five hundred dollars. The other cultivator gets 250 bushels from about three acres—and he only plows, plants, cultivates and hoes, this limited piece to obtain the same amount—and from the fine tilth and freedom from weeds, this is much easier done, even on an equal surface. The same reasoning applies to every part of the farm. Be sure then, to cultivate no more than can be done in the best manner, whether it be ten, fifty, or five hundred acres. Two well known neighbors owned, one four hundred, and the other seventy-five acres—yet the larger farmer admitted that he made less than his limited neighbor. There is a rule to determine the proper size for a farm, that can be scarcely ever misapplied, namely, *to reduce its dimensions until the labor expended shall perform every thing in the best manner.* If, for instance, the farmer now lays out one thousand dollars yearly on three hundred acres, and finds the sum insufficient, then dispose of such a portion as will allow the thousand dollars to accomplish the very best cultivation. This will give the greatest nett proceeds, even if it be but a hundred acres.

As an example of what may be obtained from a small piece of land,

the following products of fifty acres are given, and are not more than have been often raised separately by good farmers, with economical culture, and are much less than some premium crops obtained at higher cost:—

10 acres	wheat, 35 bushels per acre,	$350
5 "	corn, 90 " " 50c.,	225
2 "	potatoes, 200 " " 35c.,	140
1 "	carrots, 500 " " 15c.,	75
6 "	winter apples, 200 bushels per acre, 25c.,	300
6 "	hay, 3 tons per acre, $6,	108
10 "	pasture, worth	60
5 "	barley, 40 bushels per acre, 50c.,	100
5 "	oats, 50 " " 35c.,	87
	Total product of 50 acres of fine land,	$1445

Good land could be brought to this state of fertility, including complete underdraining and ample manuring, at less than a total cost of one hundred dollars per acre, where land is at an average price for the northern and middle States; it would then be incomparably cheaper than many poor farms at nothing; for while fifty acres could be tilled for four hundred dollars, leaving over one thousand dollars nett profits, large, poor farms, hardly pay the labor spent upon them. A proprietor of such a farm declared, "It takes me and my hired man hard at work all the year, to raise enough to pay him only."

Laying Out Farms.—This department is very much neglected. The proper disposition of the different fields, for the sake of economy in fencing, for convenience of access, and for a full command of pasture and protection of crops at all times, has received comparatively little attention from our agricultural writers and from farmers.

Many suppose that this business is very quickly disposed of; that a very few minutes, or hours at most, will enable a man to plan the arrangement of his fields about right. But this is a great error. Even when a farm is of the simplest form, on a flat uniform piece of ground, many things are to be borne in mind in laying it out. In the first place, we all know that the *fencing* of a moderately sized farm costs many hundred dollars. It is very desirable to do it well, and use at the same time as little material as possible. To do this, much will depend on the shape of the fields. A certain length of fence will enclose more land in the form of a *square*, than in any other practicable shape. Hence fields should approach this form as nearly as possible. Again, the disposition of lanes is a matter of consequence, so as to avoid unnecessary length and fencing, and occupy the least quantity of ground.

But these rules may be materially affected by other considerations. For instance, it is very desirable that land of similar quality may be in the same enclosure Some may be naturally too wet for anything but meadow or pasture; some may be much *lighter*, and susceptible of plowing, while others are not; some may be naturally sterile, and need unusual manuring with green crops. All these should, as far as practicable, be

included each in its own separate boundary. The situation of surface-drains, forming the boundaries of fields, may influence their shape; facilities for irrigation may have an essential bearing; convenience for watering cattle is not to be forgotten. Where, in addition to all these considerations, the land is hilly, still more care and thought is required in the subdivision, which may possibly require years of experience; but where fixed fences are once made, it is hard to remove them; hence a previous thorough examination should be made. A farm road, much used for heavy loads, should be made hard and firm, and cannot be easily altered; it should consequently be exactly in the right place, and be dry, level and short—the shape of adjoining fields even conforming to these requisitions; but a road little used should not interfere with the outlines of fields.

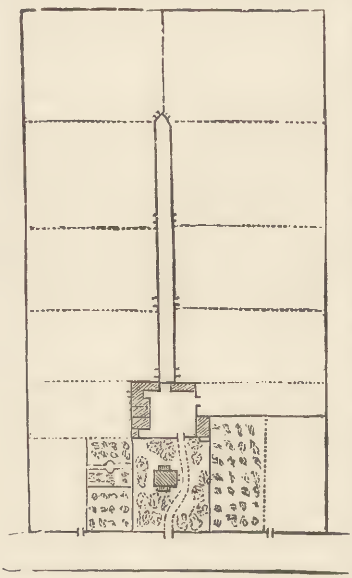


Fig. 15.

A specimen of laying out a farm is given in the annexed plan. It is of the very simplest kind, or a right-angled parallelogram, on nearly level land—a form that often occurs. It lies on one side of a public road, which is lined with forest trees. The middle enclosure on the road contains the dwelling, the barn, and other out-buildings. It is planted with trees for shade, ornament, and domestic enjoyment—not set "all in a row," but in the graceful or picturesque style which distinguishes a beautiful natural landscape. On one side are the fruit, kitchen, and flower gardens—the lot containing them being oblong, to separate certain portions of the fruit garden for *pigs*—the sovereign remedy for the curculio; the orchard may occupy the opposite lot. The remainder of the farm is divided into fields nearly square, each being entered from the lane by a good gate. These fields may be increased or lessened in size without altering the position of the lane. They should always be sufficiently numerous to admit a good rotation, and to separate at all times the pasture from the tillage land.

In laying out a farm with a very uneven surface, or irregular shape, it would be best to draw, first, a plan adapted to smooth ground, as the one

just given; and then vary the size and shape of the fields, the distance of the lane from the center, its straightness, &c., according to the circumstances of the case.

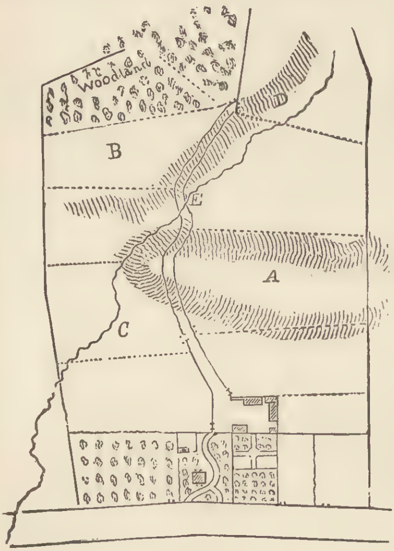


Fig. 16.

Fig. 16 exhibits an instance of modification to suit an uneven surface, where *A* is a high and broad hill, and *B* another hill stretching in an opposite direction. To avoid going over the first hill, the lane bends so as nearly to pass around it, until at *E* it crosses the valley *C D*, and then continues to rise by a gradual ascent to its termination. A bridge and embankment are made at the crossing, so as to render the road nearly level. The hill *A* is made to occupy one field, so that it may be easily plowed by passing around it, and throwing the earth downwards.

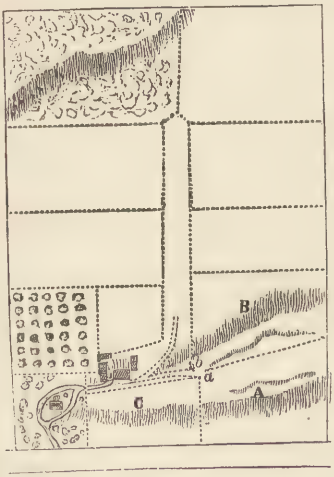


Fig. 17.

Another example is furnished by fig. 17, where a long hill or ridge lying near the public road, extends nearly its whole breadth. The house is therefore placed near the end of this hill, so that the farm road may pass around it, and the barn is nearer the center—the road rising sufficiently towards it to give all the advantages of a side-hill barn. As this hill is too large and high to plow around it, as in the last example, the fields are so divided as to be advantageously entered, and the plowing must be done with hill-side plow. The upper portion of A is accessible at *a*, and the lower part from the public road; B is entered

at *b;* and C is like A. The road from the barn to these fields being ascending, is well graded and rendered hard; and the descending road from the barn to the principal lane, is made with equal care, as most of the crops and manure pass over this portion. Some farmers, who care little for proximity to the public highway, would for convenience prefer to place the house farther back, out of sight, and nearer the center of the farm.

Fences.—The kind of fence used, and the material for its construction, must depend on circumstances and localities. A good fence is always to be preferred to an imperfect one; though it cost more, it will more than save that cost, and three times the amount in vexation besides, by keeping cattle, colts, and pigs, out of fields of grain. A thriving farmer, whose whole land, except a small part with stone wall, is enclosed by common rail fence, with upright cedar stakes and connecting caps at the top, finds that it needs renewing once in six years. He accordingly divides his whole amount of fences into six parts, one of which is built new every year. All is thus kept systematically in good repair. Stone walls, if set a foot below the surface to prevent tumbling by frost, are the most durable fence. Hedges have not been sufficiently tried.

Gates.—Every field on the farm should be entered by a good self-shutting and self-fastening gate. A proper inclination in hanging will secure the former requisite, and a good latch, properly constructed, the latter. Each field should be numbered, and the number painted on the gate-post. Let the farmer who has *bars* instead of gates, make a trial of their comparative convenience, by taking them out and replacing them without stopping, as often as he does in one year on his farm, say about six hundred times, and he cannot fail to be satisfied which is cheapest for use.

Buildings.—These should be as near the center of the farm as other considerations will admit. All the hay, grain, and straw, being conveyed from the fields to the barn, and most of it back again in manure, the distance of drawing should be as short as possible. This will, also, save much traveling of men and of cattle to and from the different parts of the farm. The buildings should not, however, be too remote from the public road; and a good, dry, healthy spot should be chosen. The dwelling should be comfortable, but not large—or it should, rather, be adapted to the extent of the lands. A large, costly house, with small farm and other buildings, is an indication of bad management. The censure of the old Roman should be avoided, who, having a small piece of land, built his house so large that he had less occasion to plow than to sweep.

The barn and out-buildings should be of ample extent. The barn should have space for hay, grain, and straw. It is a matter of great convenience to have the straw for littering stables, housed, and close at hand, and not out of doors, under a foot of snow. There should be plenty of stables and sheds for all domestic animals. This provision will

not only save one-third of the fodder, but stock will thrive much better. Cows will give much more milk—sheep will yield more and better wool—and all will pass through the winter more safely. The wood-house near, or attached to, the dwelling, should never be forgotten, so long as comfort in building fires, and economy in the use of fuel, are of any importance.

A small, cheap, movable horse-power, should belong to every establishment, to be used in churning, sawing wood, driving washing machine, turning grindstone, cutting straw and slicing roots.

Choice of Implements.—Of those which are much used, the very best only should be procured. This will be attended with a gain every way. The work will be easier done, and it will be better done. A laborer, who by the use of a good hoe for one month, can do one-quarter more each day, saves, in the whole time, an entire week's labor.

Choice of Animals.—The best of all kinds should be selected, even if costing something more than others. Not "*fancy*" animals, but those good for use and profit. Cows should be productive of milk, and of a form adapted for beef; oxen, hardy, and fast-working; sheep, kept fine by never selling the best; swine, not the *largest* merely, but those fattening best on least food. A Berkshire or Suffolk, at 200 pounds, fattened on 10 bushels corn, is better than a "land-pike" of 300 fattened on 50 bushels.

Having now taken some notice of the necessary items for commencing farming, it remains to glance briefly at

SOILS AND THEIR MANAGEMENT.

The chief distinction of soils, in ordinary practice, is into heavy and light, wet and dry, fertile and sterile. A volume might profitably be written on their management, but space can be afforded here for a few brief hints only.

Heavy (or clayey) soils are easily distinguished by their adhesiveness after rains, by cracking in drought, and by frequently presenting a cloddy surface after plowing. They are not sufficiently porous for natural drainage, but when thoroughly tile-drained, they become eminently valuable, as they retain manure better, and may be made richer than any other soil.

Sandy or gravelly loams have less strength, and may be more easily worked. They do not retain manure a long time. With a hard subsoil, they also require drainage. Sandy soils are easily tilled, but are not strong enough for most purposes, possessing too little clay to hold manure.

Peaty soils are generally light and free, containing large quantities of decayed vegetable matter. They are made by draining low and swampy grounds. They are fine for Indian corn, broom corn, barley, potatoes, and turnips. They are great absorbers, and great radiators of heat; hence they become warm in sunshine, and cold on clear nights. For this reason, they are peculiarly liable to frosts. Crops planted upon them must, consequently, be put in late—after spring frosts are over. Corn

should be of early varieties, that it may not only be planted late, but ripen early.

Each of these kinds of soils may be variously improved. Most of heavy soils are much improved by draining; open drains to carry off the surface water, and covered drains, that which settles beneath. An acquaintance covered a low, wet, clayey field with a net-work of underdrains, and from a production of almost nothing but grass, it yielded the first year forty bushels of wheat per acre—enough to pay the expense; and admitted of much easier tillage afterwards. Heavy soils are also made lighter and freer by manuring; by plowing under coatings of straw, rotten chips, and swamp muck; and in some rare cases, by carting on sand—though this is usually too expensive for practice. Subsoil plowing is very beneficial, both in wet seasons and in drought; the deep, loose bed of earth it makes, receiving the water in heavy rains, and throwing it off to the soil above, when needed. But a frequent repetition of the operation is needed, as the subsoil gradually settles again.

Sandy soils are improved by manuring, by the application of lime, and by frequently turning in green crops. Leached ashes have been found highly beneficial in many places. Where the subsoil is clayey, which is often the case, and especially if marly clay—great advantage is derived from shoveling it up and spreading it on the surface. A neighbor had twenty bushels of wheat per acre on land thus treated, while the rest of the field yielded only five.

Manures.—These are first among the first of requisites in successful farm management. They are the strong moving power in agricultural operations. They are as the great steam engine which drives the vessel onward. Good and clean cultivation is, indeed, all-important; but it will avail little without a fertile soil; and this fertility must be created, or kept up, by a copious application of manures. For these contribute directly, or assist indirectly, to the supply of nearly all the nourishment which plants receive; it is these, which, produced chiefly from the decay of dead vegetable and animal matter, combine most powerfully to give new life and vigor; and thus the apparently putrid mass, is the very material which is converted into the most beautiful forms of nature; and plants and brilliant flowers spring up from the decay of old forms, and thus a continued succession of destruction and renovation is carried on through an unlimited series of ages.

Manures possess different degrees of power, partly from their inherent richness, and partly from the rapidity with which they throw off their fertilizing ingredients, in assisting the growth of plants. These are given off by solution in water, and in the form of gas; the one as liquid manure, which, running down, is absorbed by the fine roots; and the other as air, escaping mostly into the atmosphere, and lost.

The great art, then, of saving and manufacturing manure, consists in

retaining and applying to the best advantage, these soluble and gaseous portions. Probably more than one-half of all the materials which exist in the country, are lost, totally lost, by not attending to the drainage of stables and farm-yards. This could be retained by a copious application of straw; by littering with saw-dust, where saw-mills are near; and more especially by the frequent coating of yards and stables with dried peat and swamp muck, of which many parts of our country furnish inexhaustible supplies. I say *dried* peat or muck, because if it is already saturated with water, of which it will often take in five-sixths of its own weight, it cannot absorb the liquid portions of the manure. But if it will absorb five-sixths in water, it will, when dried, absorb five-sixths in liquid manure, and both together form a very enriching material. The practice of many farmers, shows how little they are aware of the hundreds they are every year losing by suffering this most valuable of their farm products to escape. Indeed, there are not a few who carefully, and very ingeniously as they suppose, place their barns and cattle-yards in such a manner on the sides of hills, that all the drainage from them may pass off out of the way into the neighboring streams; and a farmer is mentioned, who, with pre-eminent shrewdness, built his hog-pen directly across a stream, that he might at once get the cleanings washed away, and prevent their accumulation. He of course succeeded in his wish; but he might, with almost equal propriety, have built his granary across the stream, so as to shovel the wheat into the water when it increased on his hands.

All neat farming, all profitable farming, and all satisfactory farming, must be attended with a careful saving of manures. The people of Flanders have long been distinguished for the neatness and excellence of their farms, which they have studied to make like gardens. The care with which they collect all refuse materials which may be converted into manure and increase their composts, is one of the chief reasons of the cleanliness of their towns and residences. And were this subject fully appreciated and attended with a corresponding practice generally, it would doubtless soon increase by millions the agricultural products of the country.

But there is another subject of scarcely less magnitude. This is a systematic

Rotation of Crops.—If manuring is the steam engine which propels the vessel, rotation is the rudder which *guides* it in its progress. Unlike manuring, rotation does not increase the labor of culture; it only directs the labor in the most effective manner, by the exercise of judgment and thought.

The limits of this article do not admit of many remarks on the principles of rotation. The following courses, however, have been found among some of the best, to be modified according to the various crops adapted to each region of country:

1.—1st year. Corn and roots well manured;
 2d year. Wheat, sown with clover seed, 15 lbs. per acre;
 3d year. Clover, one or more years, according to fertility and amount of manure at hand.

2.—1st year. Corn and roots, with all the manure,
 2d year. Barley and peas;
 3d year. Wheat, sown with clover;
 4th year. Clover, one or more years.

3.—1st year. Corn and roots, with all the manure;
 2d year. Barley;
 3d year. Wheat, sown with clover;
 4th year. Pasture;
 5th year. Meadow;
 6th year. Fallow;
 7th year. Wheat;
 8th year. Oats, sown with clover;
 9th year. Pasture or meadow.

The number of fields must correspond with the number of the changes in each course; the first needing three fields to carry it out, the second four, the third nine. As each field contains a crop each, in the several successive stages of the course, the whole number of fields collectively comprise the entire series of crops every year. Thus in the last above given, there are two fields of wheat growing at once, three of meadow and pasture, one of corn and roots, one of barley, one of oats, and one in summer fallow.

Operations in the Order of Time.—The vital consequence of doing every thing at the right season, is known to every good farmer. To prevent confusion and embarrassment, and keep all things clearly and plainly before the farmer at the right time, he should have a small book to carry in his pocket, having every item of work for each week, or each half month, laid down before his eyes. This can be done to the best advantage to suit every particular locality and difference of climate, by marking each successive week in the season at the top of its respective page. Then, as each operation severally occurs, let him place it under its proper heading; or, if out of season, let him place it back at the right time. Any proposed improvements can be noted down on the right page. Interesting experiments are often suggested in the course of reading and or observation, but forgotten when the time comes to try them. By recording them in such a book under the right week, they are brought at once before the mind. Such an arrangement as this will prevent a great deal of the confusion and vexation too often attendant on multifarious cares, and assist very essentially in conducting all the farm work with clock-work regularity and satisfaction.

In reviewing the various items which are most immediately essential to

good farm management, some of the most obvious will be—capital enough to buy the farm and to stock it well; to select a size compatible with these requisites; to lay it out in the best manner; to provide it well with fences, gates, and buildings; to select the best animals and the best implements to be had reasonably; to bring the soil into good condition, by draining, manuring, and good culture; to have every part under a good rotation of crops; and every operation arranged, so as all to be conducted systematically, without clashing and confusion. An attention to all these points would place agriculture on a very different footing from its present condition in many places and with most farmers. The business then, instead of being repulsive, as it so frequently is, to our young men, would be attended with real enjoyment and pleasure.

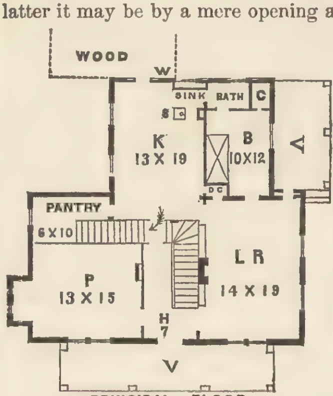
But in all improvements, in all enterprises, the great truth must not be forgotten, that success is not to be expected without diligence and industry. We must sow in spring, and cultivate well in summer, if we would reap an abundant harvest in autumn. When we see young farmers commence in life without a strict attention to business, which they neglect for mere pleasure, well may we in imagination see future crops lost by careless tillage—broken fences, unhinged gates, and fields filled with weeds—tools destroyed by heedlessness, property wasted by recklessness, and disorder and confusion triumphant; and unpaid debts, duns, and executions, already hanging over the premises. But, on the other hand, to see cheerful-faced, ready-handed industry, directed by reason and intelligence, and order, energy and economy guiding the operations of the farm—with smooth, clean fields, and neat, trim fences—rich, verdant pastures, and fine cattle enjoying them, and broad waving meadows and golden harvests, and waste and extravagance driven into exile, we need not fear the success of such a farmer—debts cannot stare him in the face, nor duns enter his threshold.

COUNTRY DWELLINGS.

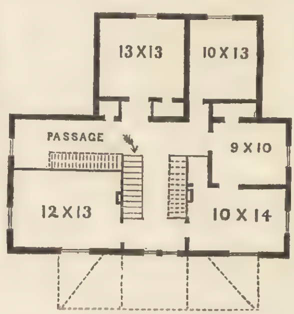
In addition to the many designs furnished in former numbers of the Register, we give the following, which we hope will contribute towards a supply of the almost interminable demand for plans of farm-houses and rural residences, now felt in every part of the country. The first is a design for a brick farm-house, a sketch of the plan of which was furnished by a correspondent. The perspective view (fig. 18) is added. The advantages of this plan are: the three rooms most used, are in direct contact with and easily accessible to each other; the family bed-room, (B) although near the kitchen, (K) is sufficiently secluded, not opening to the latter; the bath-room, as should always be the case, opens to the bed-room and to the kitchen, at a convenient point for both hot and cold

Fig. 18—BRICK FARM-HOUSE.

water; the kitchen stove (marked *s*,) stands remotely from the pantry and living-room doors, rendering these cooler in summer; the dish-closet (D. C.) is accessible to both kitchen and living (or dining) room—to the latter it may be by a mere opening and slide. The cellar is entered from the kitchen beneath the front or hall stairs, and is thus quite accessible



PRINCIPAL FLOOR



SECOND FLOOR

to both the kitchen and dining-room. The *back stairs* start at the back end of the hall, and land over the pantry. The garret stairs start from the passage at the head of the back stairs, and the garret is thus reached without passing through the front rooms and hall. "A flue," observes our correspondent, "should ascend into, or up the side of the living-room

chimney, to ventilate the cellar. The bath-room floor may descend toward the corner next the sink, where the water can pass out, and flow off with that from the sink and well." The cistern for rain-water is in the cellar, directly under the sink, where it may form a square apartment built of masonry, extending up nearly to the joists and covered with plank. A pump passes up through the floor, and flows into the sink, and a tube with stop-cock may pass through the side wall into the cellar. The well (w) is just without the kitchen door. The back door of the living-room opens by means of a double door, with a space of air enclosed on the back veranda (V.)

It may probably be built in a plain and substantial manner, for a sum not exceeding $2,200—the cost would vary $500 with the degree of finish and varying price of materials in different localities. If made of wood, it may be afforded for $400 less, at the average relative price of brick and lumber.

Small Octagon House.

Fig. 21—Small Octagon House.

The plan of this house was furnished by a correspondent—we have added an elevation. The octagon form gives the greatest amount of interior space for a given surface of outside wall, and the object of this plan has been to arrange a house for a small family, where the mistress does her own work, or immediately superintends it. Our correspondent remarks:—"The house is erected on what is called a balloon frame. The lower rooms are 8 feet 8 inches high, the upper rooms 8 feet. Roof to project two feet. Cellar wall 18 inches above ground. Weather boards either common clapboards or vertical inch boards battened. The plan explains itself, and is thought to be very convenient. Cellar stairs under hall stairs. Chimney in the center. Hall lighted as other rooms from the side, rendering the cupola unnecessary. Sides 13½ feet long inside. Built with four-inch scantling, it is about 33½ feet from outside to outside."

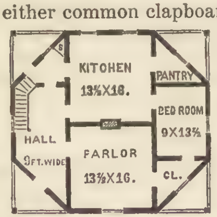


Fig. 22—Principal Floor.

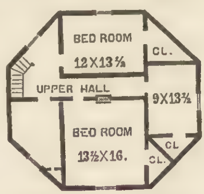


Fig. 23—Chamber Plan.

Our correspondent thinks this house might be built in the cheap way described, for seven or eight hundred dollars—with larger rooms and more substantial materials and better finish, it would cost twelve to fifteen hundred.

Many attempts have been made in designing larger octagon houses, the principal object being to economize in the amount of exterior wall—but all that we have seen are encumbered with serious defects, either in the plan or in the exterior appearance, this form rendering it especially difficult to combine neatness and convenience.

Plan of a Small House.

This plan is for a small and cheap house, and combines convenient arrangement with a compact disposition of the apartments. On account of its simplicity, but little explanation is necessary. The entry is small, and occupies but little space, yet furnishes ready access to all rooms in the house but the kitchen. The upper entry may be lighted by a dormer window, or by the omission of one of the closets at its side. Closets may be made under the stairs, for the two rooms, right and left.

Fig. 25—First Story.

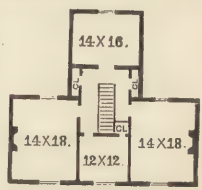


Fig. 26—Second Story.

Plan of a Small Country House.

On page 28 of the Rural Register for 1855, a plan and perspective view are given of a small house, possessing much convenience for a building of that size. A correspondent has since furnished the accompanying improvement, (fig. 27) differing by giving the two principal rooms a square instead of an octagonal form, by placing the closets between them and not at the corners, and also flanking the kitchen with two small bedrooms.

Another correspondent has still later given us another modification, shown by fig. 28, and of which he furnishes the following description:

"Having noticed a plan for a small house, (fig. 27) I will give you the plan of a house I built last summer. It is much the same as the plan

referred to, with the addition of two small rooms, viz: a bathing-room and pantry, which, I am satisfied, can be added to the first plan without increasing the cost over $15, as it takes no more outside wall to enclose the building with these two rooms than without them, and two angles less.

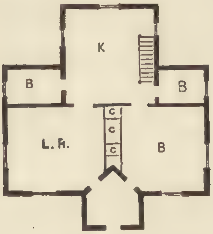


Fig. 27.

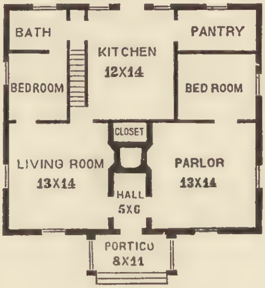


Fig. 28.

"In maturing a plan, I kept steadily several objects in view. First, how many rooms and what size a small family would need; and secondly, what form I should build on to get the greatest amount of room for a certain expense, and in the most compact form. I was satisfied the nearer square I could build, so as to give the rooms proper shape, the better, as it would enclose the greatest amount of room with a certain amount of outside wall, with the least number of angles, and in the most compact form possible. My house is 27 by 33 feet, one story 10 feet high, with steep roof, so that I have two good bed-chambers on the second floor 14 by 16½ each. On the lower floor there are 7 rooms, 2 small halls, 1 closet, and 1 wardrobe under the stairs, opening into family bed-room, and 2 fire-places. Had I plenty of money to spare, I would have had all the rooms larger and the story 12 feet high, but for a small family they do very well."

Fig. 28 is copied from the sketch sent, which we think a very successful attempt in arranging the apartments of a moderate sized house; the roof having no receding angles, is consequently not subject to leakages. The only material defect we observe, is, that the kitchen is lighted and aired on but one side—windows on opposite sides, like those in fig. 27, being more favorable to a pure air, and that cleanliness which is best secured by ample light. Its position, however, would make it warmer in winter; but also warmer in dog-days.

Most of the plans hitherto given in the Register, are for *cheap* houses. The following several views and plans of dwellings of a more costly character, are taken from Calvert Vaux's work on "Villas and Cottages," a very complete and perfect treatise on the better class of Country Houses, and possessing the rare merit of combining compact and convenient plans with neat and picturesque exteriors. The plans we have

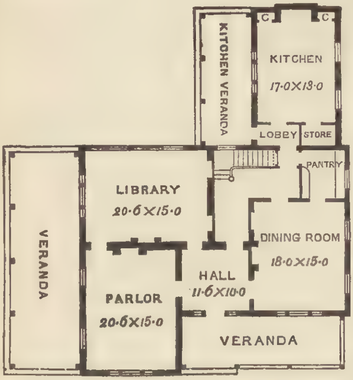
selected are only fair specimens of the many which are given in this excellent work.

Fig. 29—Irregular Country House.

The first view is of a moderate-sized country house, and the whole of the following description is copied from Vaux:

"This design was prepared and executed for a gentleman of Newburgh; and the general idea of the plan includes so much that is called for by the American climate and habits of life in the Northern States, that it will probably be better worth the attention of those who wish to build a moderate-sized cheap house, with a kitchen above ground, than many other plans of more pretension. It possesses one convenient quality, which some other styles of plans cannot be arranged to include, for it admits of many modifications, without sacrificing its advantages. It may be completely altered in outside appearance, and doubled in extent of interior accommodation, and yet be in reality the same plan. It can be adapted to almost any situation by a proper arrangement of the roofs. Thus, for example, on an elevated and somewhat open site, such a one as this house occupies, a roof of only moderate pitch is desirable. On level ground, or in a valley, a high-pitched roof should be preferred. It is also an economical plan for the accommodation afforded, as will be seen by the particulars of cost that are annexed. The house, as now finished, is constructed with an eight-inch brick wall, furred off outside, and covered with clap-boards in the ordinary way followed in a wooden building. This plan of construction was adopted in accordance with the special request of the proprietor, who preferred it to any other method. Its advantages are, that it secures to a certainty a perfectly dry interior wall. On the other hand, it seems undesirable to have a brick house, and to give it the appearance of a wooden one, as brick is the superior and more

durable-looking material. The accommodation may be thus described: A veranda-porch on the east provides a covered approach to the front door. The principal hall, 11 6 by 10 feet, gives access to the parlor and library, both of which are on the south of the house, and also to the dining-room. Another door opens on to a staircase-hall, which is easily accessible either from the principal rooms or from the kitchen wing. This is desirable, as the scale of the house would not warrant a second staircase. An east and a south veranda are supplied to the principal rooms, but each has windows that are unobstructed by any veranda. The dining-room connects through a pantry with the kitchen wing, which is also approached from the main body of the house under the staircase. A lobby opens on to a kitchen veranda,



PLAN OF PRINCIPAL FLOOR.

facing south, that provides a servant's entrance, and is convenient for hanging out clothes under cover in rainy weather. A kitchen, 17 by 13, fitted up with closets, wash-trays, and store-room, completes the accommodation on the main floor and wing. By this plan the disadvantages of living in the basement are entirely avoided, and the lady of the house can superintend her servants with ease and comfort.

"In the chamber plan will be found five bed-rooms, and a bath-room and water-closet; and in the wing two bed-rooms, a linen-press, and a house-

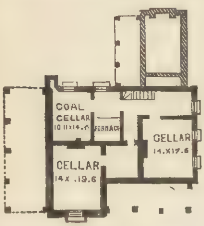


Fig. 31—Basement.

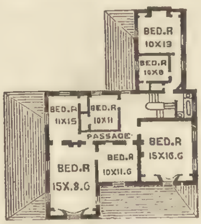


Fig. 32—Chamber Plan.

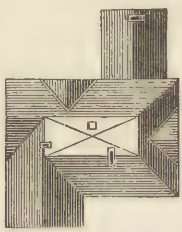


Fig. 33—Plan of Roof.

maid's sink. All these rooms are supplied with registers near the ceiling, that communicate with foul air flues separate from the chimney-flues. In the garret over the bath-room is a large well-lighted linen-room; and as this is planned on the half-landing, it is very easy of access from the

chamber floor. A large store-room, the size of the bed-room over the dining-room, is finished off under the roof in a common way, and is secured with a door after being enclosed from the stairs by a plastered partition. The remainder of the space is open and unplastered. It makes a very roomy garret, with plenty of headway all over it; but the windows in the peaks are, of course, close to the floor, and it was never intended that any bed-rooms should be fitted up here. The roof is covered with shingles, the flat being floored and covered with canvas. In the basement are cellars and furnace-room, the kitchen-wing foundations not being carried down farther than was necessary to keep clear of frost. In this house special precaution was taken, by the proprietor's request, with regard to the plumber's work. All the pipes, hot, cold, and waste, were enclosed in a tin envelope fitted tolerably closely to the pipes. As the work proceeded, this tin case was soldered up every here and there, and particularly where the pipe is led through the wall, in the first instance, and where it starts from the boiler. By this means the little insects that work their way from below, and are often found about water fixtures in rooms, are prevented from crawling up and down, and breeding among the warm pipes, as they are tempted to do in many situations.

"The carpenter's contract for this house was taken at $3500; the mason's at $2500; the remainder of the work was done by the day.

"After the contracts had been made, the proprietor left the work entirely in the hands of the architect; and, with the exception that hard walls were substituted for brown walls throughout, and that some trifling alterations were made in the arrangements for the linen-press, the plans, as signed, were faithfully executed for the contract amount, without any difficulty whatever. The carpenter's and mason's extras, which amouted to $350, included the change from brown wall to hard finish, and all the work appertaining to a large outbuilding at some distance from the house."

It will be perceived that this house, which cost about $6000, might have been built much cheaper of brick in the ordinary way; and at a still less sum, or at one-half its actual cost, if built of wood only. We do not recommend it for its mode of erection, but for its admirable plan and fine exterior views.

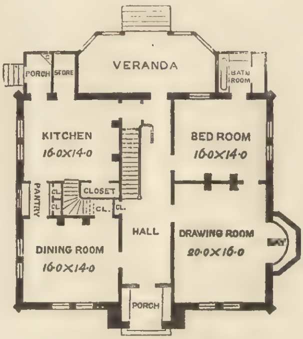
Square Brick Country House.

This house, (fig. 34) with the exception of a small central projection, is nearly a square, and it consequently possesses the advantage of much enclosed space for the amount of wall. Its otherwise monotonous appearance is relieved by the projection in front, and by the irregularity of its roof. Those who desire a more irregular outline, may apply the plans here given (figs. 35 and 36) to the accompanying neat and picturesque exterior—(fig. 37.)

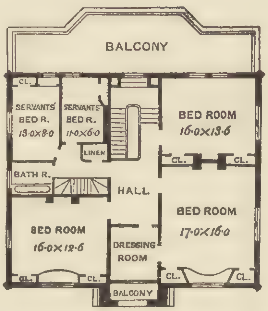
The plan, which combines many excellences, is thus described by Vaux:

Fig. 34—Square Brick Country House.

"The house is entered by a recessed porch, with a covered balcony overhead. This upper balcony being also recessed in the brick-work, and enclosed at the sides, is always in shadow, and materially helps to relieve what would otherwise be a monotonous front. This space is fitted



PLAN OF PRINCIPAL FLOOR.
Fig. 35.



PLAN OF CHAMBERS.
Fig. 36.

with a glazed frame in the winter, the porch being enclosed with folding-doors as soon as the cold weather sets in. The hall extends through the house, and communicates with a parlor and bed-room, a dining-room, and a veranda in the rear. The main stairs are in this open hall, and on the half-landing is a connection, through a French casement window, with a balcony over the veranda, from which a pretty view is gained. The

parlor has a large bay-window in it, the cornice of the room being carried round the recess that it forms. There is a private door from this room to the bed-room adjoining.

"It is not generally a desirable plan to give up the space necessary for a bed-room on the principal floor; but circumstances occur in which it is a very great desideratum, and this study may serve to show how, in a simple house, the idea may be developed. It will be perceived that a portion of the veranda is enclosed for a small dressing-room to this bed-room, thus making it a far more commodious sleeping apartment than it would otherwise be. The dining-room connects with a pantry, and is also supplied with a large china-closet. The pantry is fitted up with hanging-shelf, drawers, and closet, and connects with the kitchen, which is thus shut off from the living-rooms, although under the same roof as the rest of the house. An enclosure of the veranda, similar in size to that on the opposite side, supplies a space for a pantry and sink-room. The servants' entrance is quite convenient of access from the road, but, at the same time, is shut off by its position from interfering with the privacy of the veranda. A door, where shown near the hall door to veranda, encloses the basement stairs for the use of the kitchen, and a compact flight of stairs from the kitchen itself, provides a separate access for the servants to the bed-rooms above. This staircase occupies a very small space, and is a great addition to the convenience of the house. In the basement is a wash-room under kitchen, with an outer entrance, close by servants' entrance, for convenience in carrying out clothes to dry. The remainder of the space is not finished off, and furnishes cellars and furnace-room.


S.W. VIEW.

Fig. 37.

"A straight veranda enclosed on both sides would not, perhaps, be thought sufficiently airy, and a projection is therefore made, as will be seen on reference to the plan, to increase its size and give it a more open effect. This arrangement also adds somewhat to the external appearance of the design, at but little additional expense, while it is calculated to insure privacy in a suburban house; and in common houses the notion is carried out frequently, in a simple way, by lathing up the ends of verandas, to prevent them from being overlooked by next-door neighbors. Such a veranda as is here shown, will be almost as retired as any of the rooms inside the house.

"Up stairs are three full-sized bed-rooms, and a small bed-room, or dressing-room, a bath-room, and water-closet, a linen-press, and two servants' bed-rooms, the latter disconnected with the other apartments. This arrangement is made with the idea that the attics are to be left entirely

unfinished for a time, the house being occupied by a small family; but the plan has been, from the first, so arranged that three or four airy, well-lighted rooms can be fitted up at any future time, and if this should ever be done, the two servants' rooms shown on chamber plan, might be converted to the use of the family, and the servants' rooms arranged above."

The actual cost of this house, which was erected for a gentleman at Newburgh, with the addition of an ornamental fence, and a moderate-sized stable and coach-house, was over $7000—but the same plan may be used for a simpler and cheaper structure, or for a good farm-house of wood, that might be erected for about half that sum.

Fig. 38—Brick Villa with Tower.

For beautiful picturesque effect, this exterior view is one of the finest in Vaux' "Villas and Cottages." It is especially adapted to a somewhat varied surface of country, or where moderate hills predominate, and it should stand at some distance from the road and other dwellings. It had not been erected when Vaux wrote his work, and the cost was therefore only estimated, at over $7000. The following is his description:

"A recessed porch, large enough to serve as a morning veranda, provides access to the principal hall, which is only of small dimensions, but it is provided with cloak-closets, and contains the doors to the three principal apartments, and to the staircase. The library is in the lower story of the tower, and the design is so arranged that this tower can be omitted entirely when the first contract is made, without a disagreeable appearance being the result; and although the interior accommodation

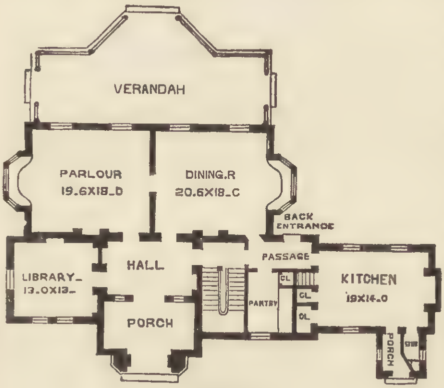
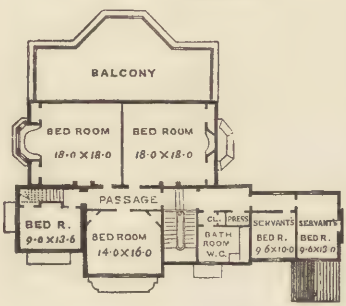
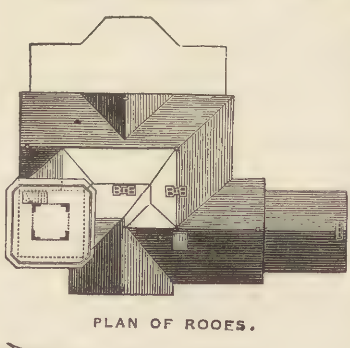


Fig. 39.



PLAN OF CHAMBERS.



PLAN OF ROOES.

and the exterior effect of the house would be materially reduced under those circumstanstances, the design would still be fair and complete, and the addition could be made at any time A parlor and dining-room open on to a veranda. Near the dining-room is a pantry, a garden entrance, and door to the kitchen, which is in a wing building.

"The chamber plan supplies four bed-rooms, and a fifth in the upper story of the tower, also a bath-room and water-closet, a linen-press and two servant's bed-rooms. The observatory is conveniently reached by continuing the staircase that leads to tower bedroom. The roof is arranged as shown on the plan. The intention in this design is to insure, as far as possible, an irregular picturesque effect, without any sacrifice of convenience or a large outlay of money. As the house is to be built on somewhat of a highland, it seems undesirable to use an acute pitch for the roof, for the trees that surround the site proposed for the house, although vigorous and well-shaped, are somewhat scattered, and of no great magnitude. They would, therefore, scarcely take their proper share in the general composition, if the roof were made too promi-

nent a feature. Considerable judgment is needed in settling on the exact position for a house like this, so as to realize all the advantages that the site affords. It must not seem to overhang the descent, or the effect will be crowded, and will give the idea from the road of a small, restricted property. Neither should it retreat very far from the brow of the hill, or the house will be shut out of sight, and altogether lost on a tolerably near approach to the premises. A happy medium, both in the location of the site and in the pitch of the roof, is the desirable point to aim at under such circumstances."

Fig. 42.

The above design of a partially enclosed veranda, was used in screening from view a kitchen and other portions of the out-buildings too much exposed by their side-hill position. The trellis-work here represented, freely admitted light to the kitchen, and secured at the same time a proper degree of privacy, by excluding the view from the garden and ornamental grounds. Similar contrivances may sometimes be used to great advantage for like purposes.

Furniture and Rural Structures of Iron.

A beneficent provision for the wants of man is shown in the large existence of iron. It is incomparably the most abundant metal found in nature. At the same time it possesses strength greatly superior to that of other metals. It is nearly twice as strong as copper, three times stronger than silver, and has nearly four times the tenacity of gold. It is almost the only metal that can be worked by welding. Its combinations with carbon in the formation of cast-iron and steel, greatly enhance its value; and its magnetic properties are indispensable to navigation.

The introduction and use of iron has kept nearly even pace with the

Fig. 43—Grape Chair.

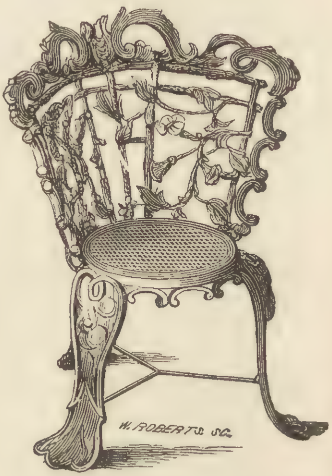


Fig. 44—Morning Glory Chair.

Fig. 45. Hall Chairs. Fig. 46,

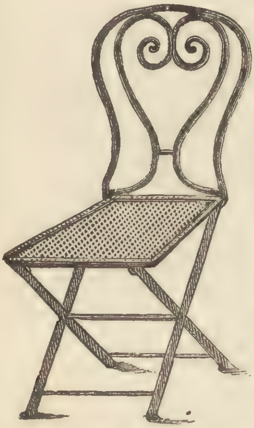


Fig. 47—Traveling Chair.

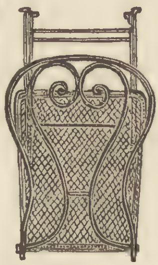


Fig. 48—Traveling Chair Folded.

Fig. 49—Wire Arm Chair.

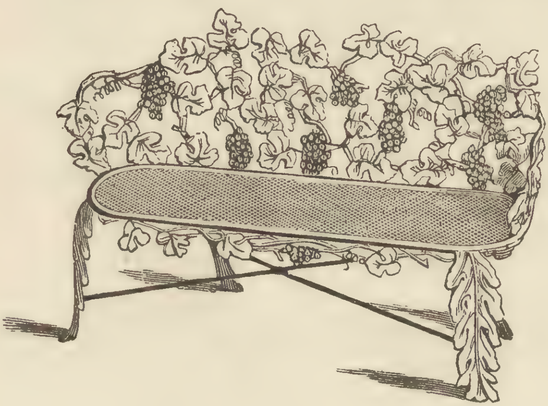


Fig. 50—Grape Settee.

progress of civilization. With the ancients it was a comparatively scarce metal. In 1740, its production in England had risen to 17,000 tons. England at present produces 3,500,000 tons—an increase of more than one hundred and fifty fold in a century. The whole production of the world is estimated at 7,000,000 tons annually—enough to load a line of common wagons reaching around the circumference of the earth. In 1810,

Fig. 51—Rustic Settee.

Fig. 52—Hat Tree.

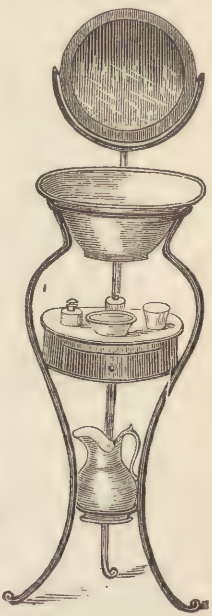


Fig. 53—Iron Wash Stand

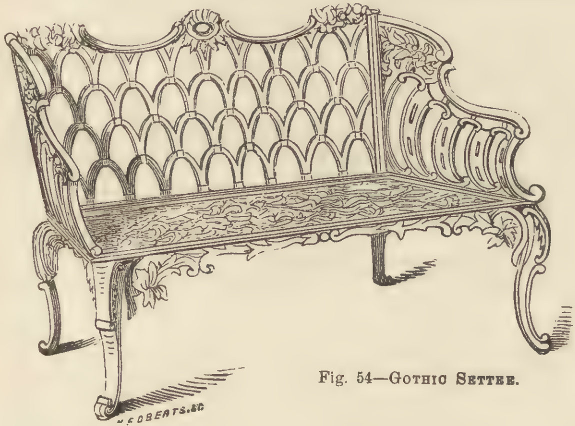


Fig. 54—Gothic Settee.

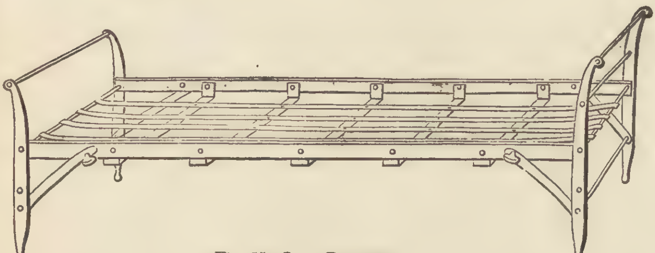


Fig. 55—Iron Bedstead.

the United States produced 54,000 tons—now the annual product is a million tons. The consumption of iron has been said to be a social barometer,—showing the relative height of civilization among nations—which is corroborated by the fact that while Great Britain and the United States manufacture two-thirds of the whole amount in the world, Spain and Norway each manufacture but one-three hundredth part, and Italy but a hundredth.

The different uses to which iron is applied, are almost innumerable, from minute cambric needles and delicate watch-springs, to iron roads stretching over thousands of miles, and ponderous bridges of many thousand tons. A bar of iron worth $5, may be increased in value by working into horse-shoes to $10; into pen-knife blades to $3000; into shirt buttons to $29,000; and into the balance-springs of watches to $250,000. We pass over all these multifarious uses, and confine ourselves at present to rural structures and household furniture.

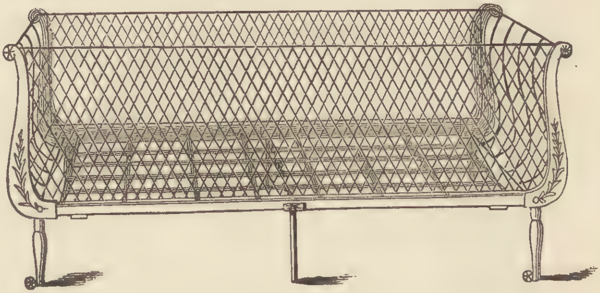


Fig. 56—Crib.

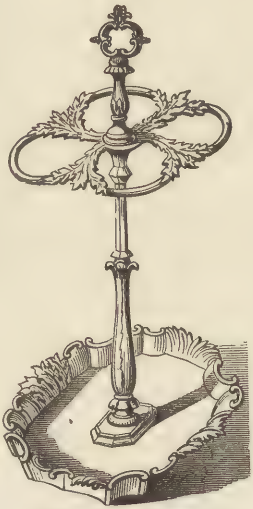


Fig. 57—Umbrella Stand.

Fig. 58—Vase.

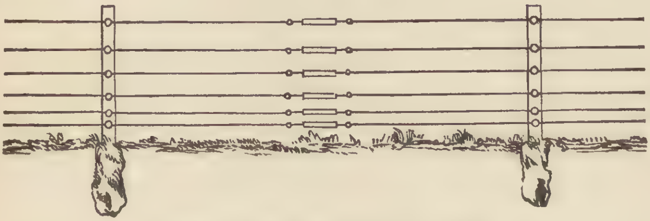


Fig. 59—Wire Fence with Wood Posts.

Fig. 60—Wire Fence with Iron Posts.

For these two purposes, there are several extensive manufactories in this country, some of the largest of which are in the city of New-York, and among them is that of Hutchinson & Wickersham, (312 Broadway,) who furnish all the articles here named, and for the convenience of our readers, we have procured and appended the prices at this establishment, as the knowledge of the cost is an important desideratum to those who wish to procure them.

Household Furniture.—Among the various kinds of *iron chairs*, we may enumerate the "Grape Chair," (fig. 43, $5)—the "Morning Glory Chair," (fig. 44, $6)—and the two Hall Chairs, (figs. 45 and 46, each $4.50) the preceding being of cast-iron; and the following *wire* chairs, namely, the Folding or Traveling Chair, (figs. 47 and 48, $4.50)—one representing it as closed for carrying, and the other as open and standing for use. The wire Arm-Chair (fig. 49) is sold at $8.

Among the *Settees*, the Grape pattern (fig. 50, $9 to $15) is an especial favorite; the Rustic Settee (fig. 51, $10) is of lighter form, and the Gothic Settee (fig. 54, $17 to $20) is best adapted to places where Gothic architecture prevails.

A neat Umbrella Stand is shown in fig. 57, ($1.50 to $6)—and iron Wash Stand, (fig. 53, including crockery, $7,) with looking-glass. A new and improved Hat-Tree is exhibited in fig. 52 ($16.) Many other forms of hat and umbrella stands are manufactured.

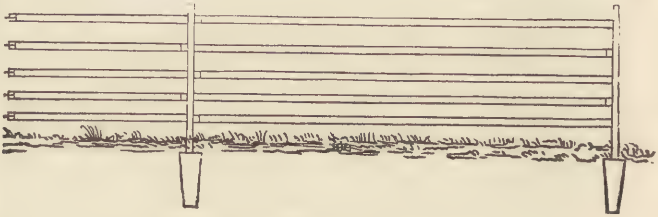


Fig. 61—Iron Fence with Flat Rails.

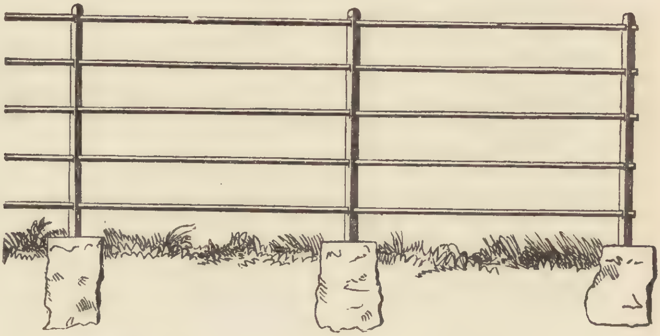


Fig. 62—Flat Rail and Corrugated Post Fence.

Fig. 63—(1) Corrugated Railroad and (2) Rural Wire Fence.

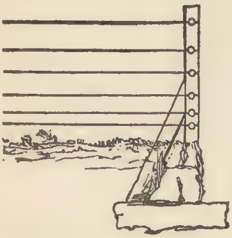


Fig. 64—Brace for End Post.

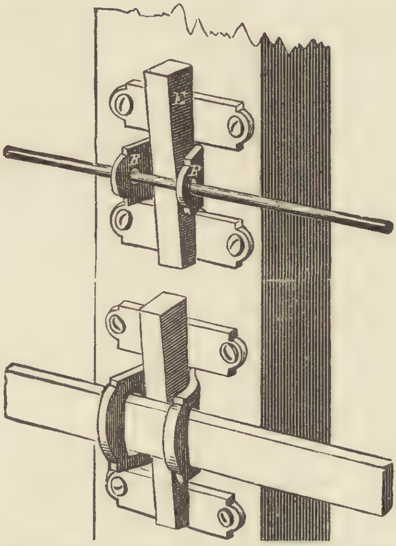


Fig. 65—Mode of Fastening Wires or Bars to Wooden Posts.

Iron Bedsteads possess two most important advantages over those of wood,—first, in their almost endless durability, and secondly in their entire freedom from bugs. They should, however, be substantially made, as the desire for a *cheap* article often induces a weak and flimsy structure, which does not stand firmly, and is liable to become bent by use. Fig. 55, when made of stout bars, is the simplest and one of the very best in use, although not so ornamental as some others, ($4 to $6.) Others of more elaborate patterns are made, ($7 to $9.) Fig. 56 ($10) shows a *Crib*, the sides of which are left out.

Rural Ornaments and Structures.—Cast-iron vases are very durable ornaments on the more finished parts of grounds, and require only occasionally a small application of paint. Fig. 58 represents a neat vase of this character with its pedestal. The prices of these vases vary with their size, from $5 to $20, and the pedestals are about $5 each.

Fences.—Wire fences have generally failed in consequence of endeavoring to make them cheap. We believe that none capable of withstanding cattle, can be made in open ground for much less than $2 per rod. A lower price reduces the size of the wires, and renders them inefficient. Fig. 59 represents one of the simplest kinds of Wire Fence, with wooden posts. The screws for lengthening and contracting the wires for heat and cold, are shown between the posts; and the brace to sustain the end-post,

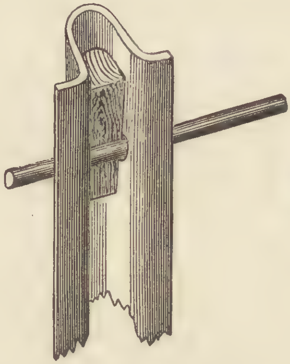


Fig. 66—Post for Wire Fence.

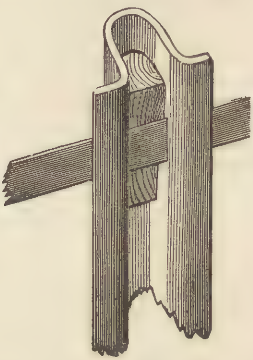


Fig. 67—Post for Iron Rail Fence.

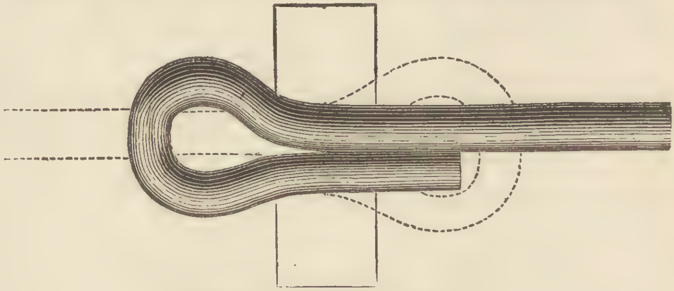
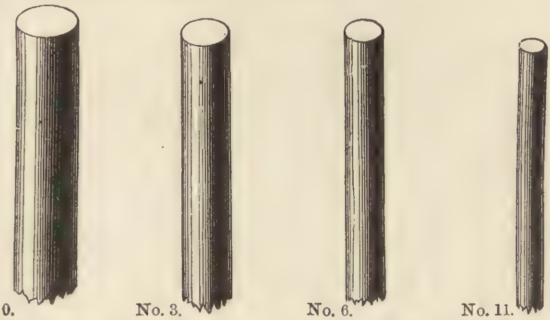


Fig. 68—Wires Fastened to the Post.

placed in a short sill at the bottom, is represented in fig. 64. This fence costs, if five wires high, $1.33 per rod, besides the posts, and 20 cents per rod for each additional wire. Fig. 60 shows a similar fence with iron posts set in cedar blocks, the cost of which for five wires is $2 per rod, and for ten wires, so as to exclude pigs, turkeys, geese, &c., $3 per rod. Fig. 61 represents the rails of flat iron, instead of wires, which cost but little more, and by being more visible, prevent cattle from striking it. The flat bars are not so liable to sag.

An ingenious mode of fastening these wires or bars to wooden posts, is shown in fig. 65; and Wickersham's Patent Corrugated Iron Fence-Post, for each of these kinds of rails, is represented by figs. 66 and 67. Fig. 62 is a more distinct figure of the Flat Rail and Corrugated-Post Fence. Fig. 63 is a still more distinct exhibition of the same, the right-hand portion showing the "Rural Wire Fence," the cost of which is from 40 to 75 cents per running foot. Figs. 69, 70, 71, and 72, represent the exact

size of wire of different sizes, and may be useful to those not familiar with the dimensions, designated by numbers.



No. 0. Fig. 69—5-16 inch. No. 3. Fig. 70—1-4 inch. No. 6. Fig. 71—3-16 inch. No. 11. Fig. 72—1-8 inch.

The mode of passing the ends of the wires through the post, and securing them to their places, is shown by fig. 68, where the square outline is the cross section of the iron post. It has square openings or slots made for each wire. Loops are made as represented, and the loops for each wire are both passed through one slot, and then turned so as to lie hori-

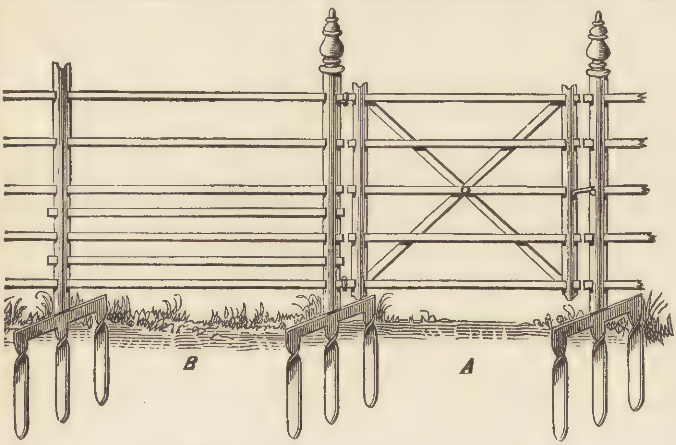


Fig. 73—Hurdle Fence (with Flat Bars) and Gate.

zontally. In this position they cannot be withdrawn, and if the short end of the wire be *bent out*, they are held so as not to draw out on either side. This figure shows the exact or natural size of the post and of the wire, which is No. 3, the smallest that should be used in fence-

making. The *end posts* must be braced in the most secure manner, or a large tree may be used—the intermediate posts may be set in a hole made with a crowbar, and gravel firmly rammed about them.

A hurdle fence made of flat bars, (with a gate,) is represented by fig. 73. Its cost is $2.50 to $5 per rod. The rails are bars an inch wide, and an eighth of an inch thick. The posts are six feet apart, terminating at the bottom in three prongs, each a foot long, which entering the ground at right angles to the fence, hold it firmly in its position. This fence is easily moved, and one man may set up sixty rods in a day.

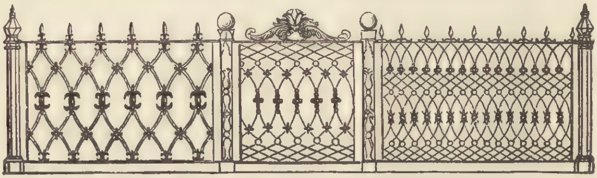


Fig. 74—Fence for Town or City Lots.

A more elaborate and costly iron Fence, intended for the small lots of towns and cities, is shown in fig. 74. The left-hand portion of this fence varies in cost from $2 to $3 per running foot; the central is $1.75 to $2.75; and the right-hand portion $1.75 to $2.

UNDER-DRAINING.

There are very few of the best soils that do not need artificial drainage. Lands that are tenacious enough to hold manures well, do not allow water to pass rapidly through them. Eight inches of such soil, saturated with water in spring, cannot quickly become dry, if all this water must creep slowly and silently downwards through the particles of earth on a broad ten-acre field. It has been shown that a single acre of soil a foot deep, holds at a wet season a *surplus* of more than two thousand barrels of water, which if discharged would leave the land moderately moist, and right for vegetation. The only way to get rid of this flood promptly, is to provide artificial channels for its discharge.

There are some sandy and gravelly soils that do not require drainage, but they can never be brought permanently to the highest state of fertility, as they do not contain clay enough to absorb and hold manure. There are also some heavy soils which have a natural drainage of porous gravel or fissured rocks beneath; but these are rare instances. As a general rule, then, every farmer whose lands are not thin sand or hungry gravel, should prepare for the thorough and systematic underdrainage of his whole farm.

The advantages are great in many ways. 1. The land when thoroughly drained may be worked at almost any time, the owner not being compelled to wait till the best time for sowing or cultivating has past. 2. Crops may be planted *early*, and sometimes doubled from this cause alone. 3. Less labor will manage the farm, as there will be less time lost in waiting tediously for water to flow off. 4. Draining prevents very effectually all injury from drought, because if the soil does not become soaked and muddy, it keeps mellow and does not bake hard. 5. The soil thus being always mellow, it allows roots to penetrate it freely, and promotes the rapid growth of crops. 6. It admits the thorough admixture of manures through the mellowed mass, and its effect is thus much increased. 7. The soil, from its porous character, is a better non-conductor of heat, and the roots of plants are less injured by freezing in winter. 8. Drained soils do not heave by frost, and plants are not thrown out by freezing.

These and other advantages are so great, that many farmers who have underdrained their lands uniformly and thoroughly, have asserted that the expense (which is usually about $30 per acre) has been fully returned to them by the increase in the two first crops. John Johnston of Geneva, N. Y., says these two crops have always repaid him; and on very wet land, the first crop has more than paid the expense, by its increase. He generally has on his drained and well-tilled land, over thirty bushels of wheat per acre, while his neighbors who cannot afford so expensive an operation, have repeatedly lost more than half theirs by the weevil, in consequence of feebler and later growth. Although the cost is $25 or $30 per acre, yet he can drain a large farm for $400 or $500—as follows: This sum will drain 20 acres the first year; in two years it will be returned in the increase, when twenty more will be completed—and so on till all is done. Gov. Wright of Indiana, said—"I knew a farm of 160 acres that was sold five years ago for $500, but after an expenditure of less than $200 in draining, the owner refused $3000 for it." He had a neighbor "whose extra crop of corn paid the whole expense of draining the first year." An instance occurred some years since, where a four-acre field yielded the first year after thorough drainage, forty bushels of wheat per acre, that was only fit for a wet pasture before. The impossibility of producing large crops, even by high manuring, on wet lands, has been amply proved, and a case is mentioned in the Transactions of the New-York State Agricultural Society, where seven acres of low, wet land, although manured annually at the rate of twenty-five loads per acre, produced per acre only thirty-one bushels of oats; but after thorough underdrainage, the manure which had been locked up by the water which enveloped it, was immediately rendered effective, and the first crop, without additional manure, was eighty-nine bushels per acre.

To ascertain where draining is required, dig holes into the earth two to three feet deep (post-holes often answer the purpose,) and observe if

water remains in these holes during the wetest periods. If it soaks away within twenty-four hours through the porous subsoil, and leaves the bottom dry, then draining will be wholly unnecessary. But if the water remains several days, then artificial channels will be required to carry it off.

LAYING OUT DRAINS.

Laying out the course of the drains to relieve the land of its surplus water, is an operation of great importance. If it is judiciously done, the water will be quickly and safely conducted away; if badly performed, much labor and expense will be lost, and the water, if reached, only carried from one place to flood another.

There are different modes of laying out drains, which may be comprehended under the two general heads of SIMPLE AND EASY; and, COMPLEX AND INEFFICIENT.

The former consists in adopting one general rule for all cases, namely, to run parallel drains by the shortest and steepest course down the natural slope of the land, at regular distances, usually about thirty feet apart. The latter requires an examination of the seams and strata of the soil and subsoil, and the position of springs and wet spots, and the adaptation of various crooks and side courses in the drains to meet all these points, without any regular system. The former, if applied to a gradually descending field, or to the side of a hill or slope of a valley, can scarcely ever fail of effecting a complete and thorough drainage of the whole surface,—for generally the surplus water at wet times is distributed evenly over the whole surface, and it will be carried off evenly and uniformly by this regularly distributed system; and even where there are springs, they will be approached within a few feet, and be generally tapped before reaching the surface, by some one or other of these drains.

Many pages have been written, in applying geological principles to the operation of draining; but with a few rare exceptions, all the rules thus developed have only served to make the subject more difficult to beginners, and more inefficient in practice. One of the leading characteristics of this mode is to examine the strata, ascertain through what seams the water oozes out at the surface, and by judicious side ditches, running obliquely downwards, to tap and cut off these streams. The annexed figure (fig. 75) exhibits the mode by which this is done, as described in standard works on draining. The dotted portion represents gravel or porous soil, alternating with hard, impervious layers. The ditch at *a*, cut through into the hard bottom, intercepts all the water from the upper gravel bed, and prevents it from injuring the soil below; while the ditch *b* is of no use, as it does not extend down far enough to reach the water which flows

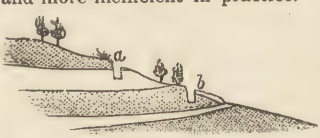


Fig. 75.

over the second hard layer. This reasoning appears well on paper, but is defective when applied in practice; for if these ditches have any descent, as they must have in order to discharge, they must cross the hard strata, and can be therefore carried as the figure represents them, only for a very short distance. Incomparably better and more efficient is the practice of cutting through all these strata at right angles, directly down the hill, as shown in fig. 76, each drain thus made forming a complete discharge for every accumulation of water. In extreme cases, very short side drains or branches may extend laterally to cut off any unusual escape of water to the surface.

Fig. 76.

A mistaken practice is often adopted, by running drains obliquely instead of directly down hill, even in soils where there are none of the seams or layers just described, but where the subsoil forms a uniform substance, for the retention of water. The accompanying figure (fig. 77) will serve to show the error of this practice, A A A being the drains, and the dotted lines the channels of moisture, as they leach downward through the soil. The shortest descent down the sloping surface is from B to C, the drains being placed at an oblique angle of about forty-five degrees. We shall suppose these drains to be two rods apart. Very little, obviously, of the water in the soil will pass into the one next *above* it, but will nearly all flow into the one below. Then, as from *a* to *c* is two rods or 33 feet, the distance from *a* to *b* will be 47 feet, or nearly *three* rods, which is the furthest distance for the water of the soil to soak into the ditches.

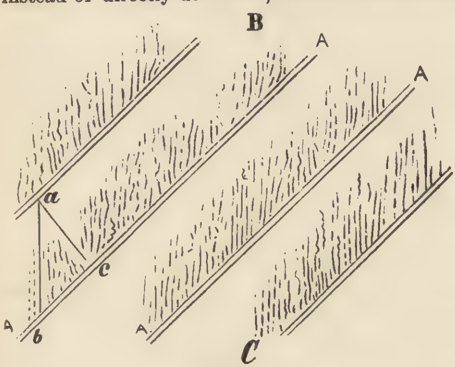


Fig. 77.

Let us now examine the other mode of laying the channels, namely, directly down hill by the shortest course.

B C, Fig. 78, is the direction of the descent, down which the drains are laid two rods asunder. These receive the water equally on both sides, the effect of each drain extending half way, or to the straight dotted lines. The direct distance is consequently but one rod, as shown by *c b*;

but as the moisture must flow obliquely to reach them, the distance becomes greater according to the degree of obliquity. If this obliquity is forty-five degrees, (or half way between perpendicular and horizontal,) as shown by the line *a b*, then the distance will be 23 feet, or only *one-half* that required in the former or oblique mode of ditching. Even if the moisture should descend so much nearer to a parallel with the ditches, as to pass sideways only half its own distance of descent, (as shown by D D,) *d e* being this distance; even in this case *d e* would be only about 37 feet, or a little over two rods, being *ten feet* less than in the former mode.

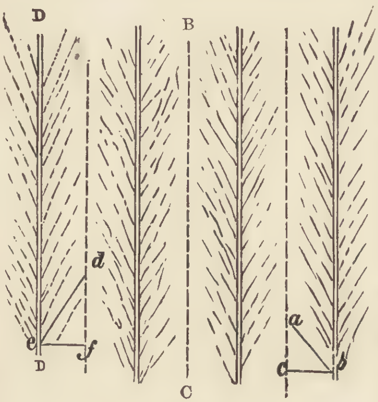


Fig. 78.

It may therefore be laid down as a safe rule, that the perpendicular drains would be as efficient at two rods apart, as the oblique ones at two-thirds of this distance.

But there are other influences still more in favor of the perpendicular mode. When the drains are oblique, the water does not find so ready a passage down them, and consequently if tile is used they must be of larger size. The passage through them being somewhat obstructed by a want of descent, the water after it has filled them, tends to leak out on the lower side, (fig. 79) and if the subsoil is pervious, thus to add to the amount of water in the soil below, instead of draining it. But when it once enters the *perpendicular* drains, it never passes back into the soil, but escapes by the channel thus made for it.

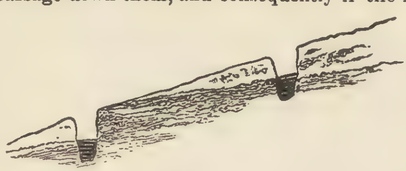


Fig. 79.

The question is sometimes asked, why the water will flow *sidewise* for reaching the perpendicular drains, and if it will find its way at all into them? The answer is, water always tends (unless an obstruction is presented,) to pass from a soil filled with it, to one that is dry or empty, in the same way that it will run out on all sides of a basket; and as soon as that portion nearest the ditch becomes drained, more remote portions flow in to fill the vacancy, till all escapes.

An eminent standard work gives the accompanying figure (fig. 80) of the mode for draining the sides of a hill. It is true that the drains rep-

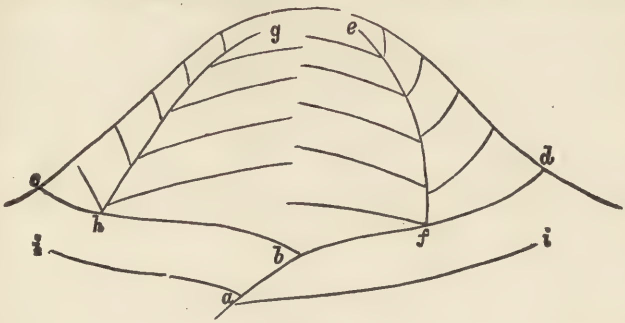


Fig. 80.

resented could hardly fail to carry the water safely down so steep a descent; but a more complete way is shown in fig. 81, where the water not only descends more readily and directly, but the drains are more

Fig. 81.

evenly distributed, and the same result is therefore effected at less cost. In fig. 80 there are many angles or corners with a drain on each side

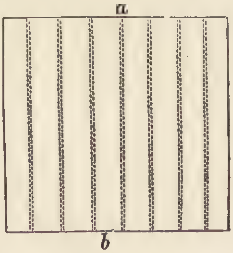


Fig. 82.

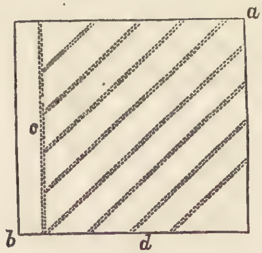


Fig. 83.

unnecessarily near; in fig. 81 there is no surplus work of the kind, and hence it is more economical.

Laying out Drains on Irregular Surfaces.—Where there is a continued slope from one side of a field to the other, nothing is easier than to determine the position of the drains, as, for example, in fig. 82, the descent being direct from *a* to *b*; or in fig. 83, where the slope, although diagonal, is uninterrupted from *a* to *b*. In the latter instance, if the

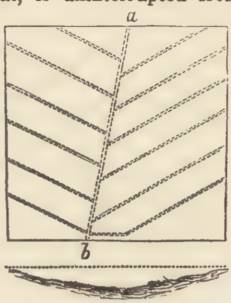


Fig. 84.

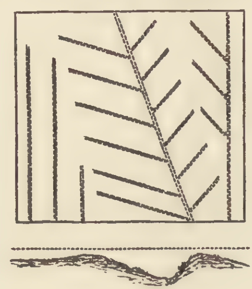


Fig. 85.

drains may be continued on into the next land, they may simply pass the boundary as at *d*; but if another owner possesses the adjoining field, it may be necessary to collect a part of the drains in one larger one, as at *c*. If the field occupies a hollow or valley, as shown in fig. 84 by the profile beneath, a large main drain must be made through the bottom of the valley, and the other drains conducted into it. A more irregular surface is shown by the profile at the bottom of fig. 85, and the drains are seen as corresponding to this surface.

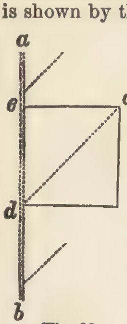


Fig. 86.

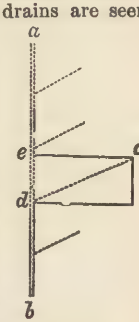


Fig. 87.

In order to determine at *what angle* the side drains should enter the main one, the relative rate of descent of each must be ascertained. If, for example, the descent of the main drain *a b* (fig. 86) in the bottom of a hollow, is one foot in ten; and also the slope of the sides, *c* to *e*, is one foot in ten; then the side drain must make an angle of forty-five degrees, or form the diagonal of a square between the two, *c* to *d*. But if, as in fig. 87, the descent from *a* to *b* is *one* foot in ten, and from *c* to *e*, *two* feet in ten, then the angle must be sixty-seven and one-half degrees, or the side drain form the diagonal of a parallelogram twice as long as wide. The same rule will apply to any other degree of descent. The reader may understand the subject more clearly by partly

opening a book, and representing by the facing leaves the sides of the valley.

Partial Drainage.—It sometimes happens that land is made up of wet hollows and dry knolls, irregularly distributed; and it becomes absolutely necessary to drain the wetter portions at once, in order to cultivate the field with any profit. Fig. 88 represents such a field, and the double

Fig. 88.

Fig. 89.

dotted lines show the position of the drains for carrying off the water from the hollows. If these hollows are not more than two or three rods wide, and the hills are of porous or gravelly soil, this may be all the drainage required; but if the hollows are wider, short branches at regular intervals will be needed, and if the hills are of a heavy or clayey nature, the benefits of complete drainage cannot be expected till side drains relieve the slopes, as shown by the dotted lines in fig. 89.

The natural course of streams as seen on a map, or the unobstructed descent of water on the surface of the land in a hard shower, may be nearly copied in laying out drains. When the face of a country has a regular slope towards a lake or river, the streams are nearly parallel, and take the most direct course downwards—they do not run obliquely, as some would lay their ditches. Among hills and through irregular hollows, the natural water-courses are the same as artificial channels should be; and the surplus water in a violent rain takes precisely the same direction down the sides of a valley, and enters the brook at the bottom at the same angle as already pointed out, allowance being made for accidental obstructions.

Size of the Bore.—The proper size of the tile for drains, to carry off the water freely, founded on an accurate estimate, appears never to have been treated of by any writer on draining. It is therefore hoped that the following suggestions may be useful.

It is necessary, first, to ascertain the amount of surplus water existing in an acre of soil, at the wettest period. This will vary considerably with

the nature and depth of the soil, but it may be laid down as a general rule that the soil and subsoil down to the depth reached by drains, when heavily saturated with water, contains a needless quantity, at least equal to a depth of three inches over the whole surface, which would be more than one thousand hogsheads per acre. The drains should be of such a magnitude as to carry this off in twenty-four hours. If each drain relieves a space of a rod on each side, or a strip of land two rods wide, it must be eighty rods long for an acre of this breadth, and carry off forty-two hogsheads every hour, forty-six gallons per minute, or three-fourths of a gallon per second. A tubular tile, two inches in diameter, and perfectly smooth and straight, would accomplish this if it had a descent of one foot in twenty. With ordinary imperfections, it would require a descent of about one foot in ten or twelve. If the descent was only one foot in fifty, it would require a three-inch bore.

The size of the drain is controlled by three causes: its rate of descent, its length, and the number of branches it receives. The length and number of branches may be included together, for three branches, each ten rods long, would be the same as a single channel thirty rods long. In all estimates, therefore, the aggregate length of the branches may be taken as that of a single drain; and the area they cover will readily show how much water is to be carried off, allowing, as before, one thousand hogsheads per acre. By the use of the following table, which the writer of this article has calculated for this purpose, and which is sufficiently accurate for ordinary use, the size of the bore for different areas and slopes may be readily determined. A deduction of one-third to one-half must however be made for imperfections in the tile and laying.

Diameter of Bore.	Rate of Descent.	Velocity of Current per Sec'd.	Hogsheads discharged in 24 hrs.
2 inches.	1 foot in 100	22 inches.	400
"	" 50	32 "	560
"	" 20	51 "	900
"	" 10	73 "	1290
3 inches.	" 100	27 "	1170
"	" 50	38 "	1640
"	" 20	67 "	3100
"	" 10	84 "	3600
4 inches.	" 100	32 "	2500
"	" 50	45 "	3500
"	" 20	72 "	5600
"	" 10	100 "	7800

For very short drains the preceding table would not answer, as it requires some length to give the water its full velocity.

Leveling.—Where land is nearly level, it becomes important to measure the descent accurately, in order to lay the drains where they will be most effective; and where the descent is considerable, it is desirable to know the degree of slope, in selecting tile of the proper size, according to the preceding table. Novices in draining often follow no other rule than to "cut and try"—that is, after the ditch has been cut, they turn the water in, and if it forms pools along the bottom, they have to re-dress

it; but if the water happens to run the wrong way, they may be compelled to dig the whole over again. This is a bungling and costly way of doing the work. A ditch should be so laid out, that the owner will know confidently before-hand what will become of every drop of water that enters it. A few minutes previous attention may save days of labor.

The simplest level for drains is the *span level*, shown in fig. 90. It is especially convenient for giving a uniform descent to the bottom. Two narrow strips of board are fastened together as represented, with a bar or brace connecting them. The plumb being suspended from the top, it is first placed on a perfectly level floor or sheet of ice, and a mark made on the cross bar. A block an inch thick is then placed under one leg, and another mark made. The leg is then raised another inch, for a third mark. In this way the cross bar is accurately graduated. By measuring the distance of the two legs apart, the rate of slope may be now accurately determined. If, for instance, the legs are eight feet three inches or half a rod apart, the first mark will indicate a descent of two inches per rod; the second, four inches, and so on.

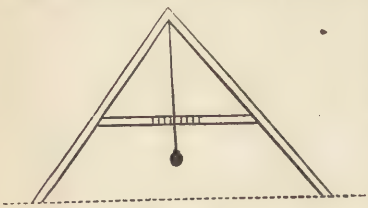


Fig. 90.

Where greater accuracy is required, as in long and nearly level ditches, the "water level" may be used. It may be made of a lead tube about three feet long, bent up an inch or two at each end, and stiffened by fastening to a wooden bar, A B—(fig. 91.) Into each end is cemented, with sealing-wax, a small and thin phial with the bottom broken off, so that when the tube is filled with water it may rise freely into the phials. If the tube be now filled with water colored with cochineal or any dye-stuff, and then placed upon the tripod, C, by looking across the two surfaces of liquid in the phials, an accurate level may be obtained. When not in use, a cork is placed into each phial. "Sights" of equal height, fastened to pieces of cork floating on the water, as shown in fig. 92, give a more distinct line for the eye. The sights are formed of fine threads or hairs stretched across the square openings. To ascertain whether these threads are both of equal heights

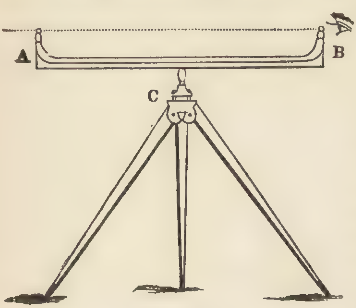


Fig. 91.

Fig. 92.

above the water, let a mark be made where they intersect some distant object; then reverse the instrument, or turn it end for end, and observe whether the threads cross the same mark. If they do, the instrument is correct; but if they do not, then one of the sights must be raised or lowered until it becomes so.

Depth and Distance of Drains.—Experience has determined that twenty-five to thirty feet apart, for compact or clayey soils, and thirty-five to forty for light and porous soils, are proper distances for accomplishing speedy and effectual drainage. Three feet is the most economical depth. When draining was first introduced into some parts of Britain, the drains were made one and a-half or two feet deep, and eighteen feet apart. After many thousand miles were laid, they became defective. They were then made about three feet deep, and twice as far apart. This cost less, and was more efficient. A greater depth and distance was again found unfavorable.

Mode of Cutting Drains.—British works, and American copied from them, figure and describe twenty or thirty different kinds of tools for cutting ditches. Some of them as usually made, are heavy and awkward, and others are very rarely used. A spade for common earth, a shovel for loose earth, a pick for hard subsoil, a narrow spade for the deeper portions of the drain, a long-handled pick for the operator to work the narrow bottom while standing above, and a narrow scoop-hoe for cleaning out the narrow bottom, (fig. 93) are all that are commonly required. These will enable the digger to cut a ditch three feet deep, a foot wide at the top and four inches at bottom, (which is wide enough for tile,) by the removal of less than half the earth needed for the free use of the common pick and spade, the workman standing in the bottom. Where, however, stone are used for filling, a greater width is required.

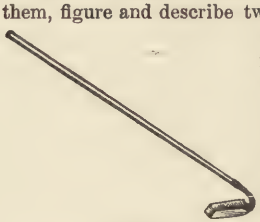


Fig. 93.

The labor of cutting drains will be greatly lessened, by first plowing two furrows from each other, and afterwards repeating them, and then shoveling out the loose earth. A subsoil plow will next loosen up the earth for shoveling, down to a depth of more than two feet. Plows, like subsoilers, made on purpose, and capable of running down three feet deep, have been manufactured in different places, and have been found to save nearly one-half the labor in hard soils, by obviating the use of the pick.

The cost of cutting drains varies greatly with the soil. In very hard and strong subsoils, the work cannot be done for less than thirty cents per rod, if all done by hand; while in common or easy soils it may be performed for twelve or fifteen cents.

Ditching machines, as yet constructed, have proved too costly for common farmers, and are not applicable to stoney land.

MODE OF FILLING DRAINS.—Tiles form the most perfect channels for underdrains. They may be tubular, as shown in fig. 94, and laid in the bottom as represented by fig. 95; or they may be in the horse-shoe form, like fig. 96, which answers a good purpose when placed on a very hard or rocky bottom; or if the bottom be not hard, which is most usually the case, plates of tile, termed *soles*, are first laid, to prevent the heavy weight of earth above from sinking the edges into the soil—(fig. 97.) This is, however, complex and expensive, and hence the tubular tile is now generally used. They are most rapidly and easily laid by means of the tile-hook, (fig. 98) which is simply placed within the bore, and they are lowered to their place. A little earth is then rammed down on each side, to keep them straight until covered.

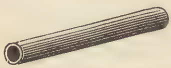


Fig. 94—PIPE DRAIN.

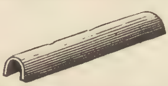


Fig. 96—HORSE-SHOE TILE.

Fig. 97—HORSE-SHOE WITH SOLE.

Fig. 95.

Fig. 98—TILE HOOK.

Where the soil is quite soft, they must be laid upon flat stone, tile soles, or narrow boards of durable wood. They may be first covered with straw, small brush, gravel or small stone, or if collars are placed on the joints, inverted turf may be laid in direct contact with the tile. If in hard, clayey earth, small stone alone will answer, with straw or turf placed upon them before the earth is filled in. But if the subsoil approaches the nature of quicksand, more care will be required, and fine gravel, with a heavy coating of straw, may be necessary.

The importance of filling most of the ditch above the tile with stone, is sometimes urged, under the belief that water cannot find its way down to the bottom through three feet of earth. But a moment's thought will show the fallacy of this objection, for if the drain will carry off the water lying one rod distant horizontally, it will convey away with far greater ease what happens to be only two or three feet directly above.

It was once the practice to perforate tile with small holes, to let the water pass into them; but it has been since found that the joints at the ends will admit all that is required.

Cost.—Tubular tile, with two-inch bore, (which is large enough generally, except for main drains or those nearly level,) usually costs about ten dollars at the manufactory, for enough to lay sixty rods, and forms the cheapest filling. It is true that stone may be often had upon the fields for the picking; but the increased width required for the drain, and the additional time in laying them, will usually be found more than ten dollars

for the sixty rods. Tile usually forms the most durable drains. John Johnston of Geneva, N. Y., found those which had lain eighteen years, as perfect as the day they were laid.

Tile, however, is not always to be had; and it is often an important object to get rid of stone; hence stone drains may sometimes be advisable. They are occasionally made by throwing small stone promiscuously into the ditch; but unless the descent is very steep, or the quantity of water extremely small, they drain slowly and imperfectly, the water filling them up several inches.

The most common way, and usually the best, for filling stone drains where the stone are nearly *round*, is shown in fig. 99, made by just laying a row of small stones on each side of the bottom, leaving an open channel between them about three inches wide, and then covering this channel with flat stones, and filling the ditch with small ones promiscuously

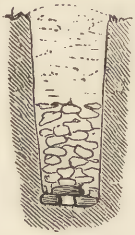


Fig. 99.

Fig. 100.

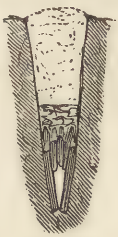


Fig. 101.

thrown in, to within about 15 or 18 inches of the surface, so as to be below the reach of the plow—and the remainder with earth. It is hardly necessary to remark that the upper surface of the stone must be either covered with coarse gravel or small flat stone, and then with straw or inverted sods, to exclude the earth from the stones; and if the soil is nearly free from clay, more care in this respect will be needful,—and perhaps a covering of hard-wood slabs will be necessary to keep the earth to its place. If the bottom of the drain inclines to quicksand, a layer of flat stones must be first laid on the bottom.

The chief objection to the mode just described, is the necessity of cutting a ditch nearly a foot wide at the bottom, to allow laying the channel. Flat stones, on the contrary, obviate the labor of cutting a wide ditch; the channel being constructed by placing three flat stones together, as shown in fig. 100. The bottom of the ditch is cut with a pointed spade, so as to have an angular trough; flat stones are then selected, all of the same width and fitted into and meeting each other at the bottom, and then covered by a third flat stone reaching across them. The ditch above this is partly filled with irregular fragments of stone, and covered as already described.

A still better way is shown in fig. 101. The ditch is cut with the narrowest kind of spade—a mode familiar to English ditchers, and which they execute with great expedition. Flat stones, without regard to their exact width, are placed against the sides, open at the top. Into this opening, one or more thicker flat stones are thrust, as represented in the cut, and the drain then filled as before mentioned. The advantage of this mode is in obviating the necessity of selecting the stone, as almost any width will answer.

The two last modes, if well made, will last as long as tile-drains; as the earth cannot fall into them from the sides, nor rise from the bottom, even if of a quicksand nature; and in the last described, the stones being mostly vertical, admit the free descent of the water from above.

Brush Drains, on land easily dug, and which affords a rapid descent, have been found to answer a good purpose. As they cannot carry off much water, they should never be very long, nor used for main drains. They should never be employed on nearly level land. Being nearly excluded from air, the brush will last many years. Some kinds, as cedar, will last much longer than others.

Fig. 102.

The drain for brush is dug like any other drain, but is best if a foot or more wide. The brush may be cut a few feet in length, and should not be more than an inch or two in diameter. If the branches are straight and nearly parallel, they may be larger and longer than if crooked and spreading—in the latter instance they must be cut quite short, or they will not lie well. Commence always at the *upper* end, and let the butts rest on the bottom of the drain, with the tops pointing upwards, or *from* the descent. This position tends constantly to throw the descending water to the bottom or lowest part of the drain. If a sufficient quantity of brush be laid in to fill the ditch, (fig. 102) it will occupy, after being trodden down and the earth filled in, only about one-third of the ditch—(fig. 103.) Inverted turf forms a good cover for the brush before throwing the earth in. The sides should be nearly perpendicular, or the brush will not settle well.

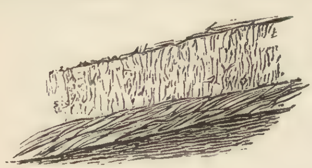


Fig. 103.

Timber, in the form of scantling and narrow boards or slabs, has been sometimes used for drains, but it is costly, decays in a few years, the air entering the channel freely, and is to be recommended only in extreme cases, or where other materials cannot be procured.

CULTURE OF THE PEAR.

On several accounts, the pear possesses advantages over other fruits. The first is its delicious quality, as found in the finest varieties—its buttery or melting texture, and its delicious and perfumed flavor. In this respect it greatly excels the apple, and keeps nearly as well. Even the peach is scarcely superior, while it lasts only two or three days.

But the pear, like everything highly desirable and valuable, cannot be had without attention, labor and skill. There are only a few exceptions to this general rule. The relative prices of the apple and pear being about as one to ten, show at the same time the superior value of the latter, and the superior skill required to bring it to perfection.

The first questions that occur to every one commencing any branch of cultivation, are in relation to the probability of success, and the real value of the crop. The best answers are given by pointing to those who have made the experiment. If some have been uniformly and eminently successful, their mode of treatment must be examined. If others have as signally failed, the causes of their disappointment are not less worthy of attention.

The market value of good pears is a good indication or measure of the amount of attention which this fruit deserves. The following are a few examples. Dr. C. W. Grant of Newburgh, gathered 400 specimens from a tree of the Flemish Beauty only eight years planted, which he sold for $30, or 13 cents each. T. G. Yeomans of Walworth, N. Y., sold in 1857, nearly his entire crop from several hundred trees of the Angouleme, at $14.50 per barrel, or 12 cents each by the barrel. Very large specimens of this variety have in some instances retailed at a dollar each. Austin Pinney of Clarkson, N. Y., sold some of his pears in 1857, at 10 cents each, or $18 per bushel. J. Stickney of Boston, obtained for his crop of the Louise Bonne of Jersey in 1856, $10 per bushel. John Gordon of Brighton, near Boston, sold Bartlett pears raised with the highest cultivation, and with skillful management in preparing for market, for $10 per bushel, while good ones, with more common care, brought only $3 per bushel. Ellwanger & Barry of Rochester, sold their best well-ripened Glout Morceau pears in winter, at $3 per dozen, and others have done the same.

There are very few if any old bearing orchards of standard pears in this country; but single trees in numerous instances have yielded for successive years, $20 or $30 per tree—which would be at the rate of three or four thousand dollars per acre, if a whole orchard was equally successful. The reason of this deficiency of old orchards, is the long time required to bring orchards into a full bearing state, nearly all that have been set out being yet young. But as dwarf pears come quickly into bearing, we

have already many examples of their great success. Among them are the following:

T. R. Austin, near Boston, (says Col. Wilder,) set out 500 dwarf pears, about twelve years since. They commenced bearing in about three years, and have borne regular and abundant crops ever since. An account was kept of the sales from them for the past six years, which amounted to $3,408. They occupy about an acre.

Ellwanger & Barry of Rochester, have a large continuous number of trees of Louise Bonne of Jersey, set out eight years, which the writer found yielded one to one and a half bushels per tree, or at the rate of at least 500 bushels per acre. Three dollars per bushel was the lowest price on the tree—which would be $1,500 for an acre in one year. The two previous years the crop was nearly the same. When four years old, they yielded at the rate of $500 per acre. They also had a larger plantation of dwarf Virgalieus or Doyennes, which gave the fourth year at the rate of $500 per acre, and about the same the sixth year.

W. P. Townsend of Lockport, had about an acre of dwarf pears of different sorts, that bore the fifth year from the bud, forty-one barrels, selling at $10 per barrel, or $410 for the acre. The quince stocks on which they stood had been set out seven years before, and had not been removed.

T. G. Yeomans of Walworth, N. Y., has large plantations of dwarfs, about eight years old. They are eight feet apart, and are cultivated and the soil kept perfectly clean by two horses walking abreast, at less cost than a corn-crop requires. They have yielded from half a bushel to a bushel per tree, and have sold for $14 per barrel—which is at the rate of about $2,000 per acre.

The preceding examples are purposely selected as a few of the most successful, to show what may be accomplished by good treatment. Those varieties were chosen for the experiment, that long experience had proved best for growing on the quince; and good and enriching cultivation was given. The expense, however, after the plantation was made, was not greater than is required to keep a field of corn or potatoes in good condition,—horse or hand labor being employed on both.

The question now occurs,—Are these fair samples of the success usually attending the planting and culture of dwarf pears? The answer is,—Very far from it! A tree-salesman of extensive observation, lately gave it as his opinion that not more than one dwarf pear tree in a hundred was treated with that care that insured successful bearing. Doubtless this was an over estimate, but so great is the general neglect that probably not one in twenty fully succeeds.

The causes of failure are worthy of examination. Formerly there were many losses from working those sorts on the quince that were entirely unfitted for the purpose. In other instances poor stocks were used, none

but the large and late-growing French varieties being of much value. But the greatest of all causes of failure has been and still is *neglected cultivation.* There is a *diseased public habit* in relation to the care of all fruit trees, that appears to be incurable. Planters listen to admonitions on the subject, admit the full force of all that is said, and then, as they do in case of common sermons, go and immediately practice the contrary. The writer has just met with a farmer who set out dwarf pears, and *sowed oats among them!* He was asked if he would sow oats among his corn? "Why, no; I s'pose this is a very bad way to treat them, but you know every body does so!" An intelligent cultivator of other crops wondered greatly why his orchard of dwarf pears did not flourish, although he spaded a circle around each as they stood in grass, as often as once a year. He might with equal propriety have been surprised that his horse grew poor, although he never omitted feeding him once a month!

It may be laid down as an unalterable rule, that *no young orchard can flourish, and that one of dwarf pears cannot live, unless a complete system of broadcast cultivation is applied to it.* Digging circles with the spade is wholly insufficient. As commonly performed, this practice does not benefit a tenth part of the roots, often not a hundredth. Writers generally say that the roots spread as wide as the spread of the branches; while in reality they cover a surface ten times as great as this rule would indicate. The nearest general rule is that the roots run as far from the foot of the stem as the height of the tree. If, therefore, the tree (fig. 104) is ten feet high, the extent of the roots from *a* to *b* will be twenty feet. A young orchard of such trees, therefore, planted twenty feet apart, will have

Fig. 104.

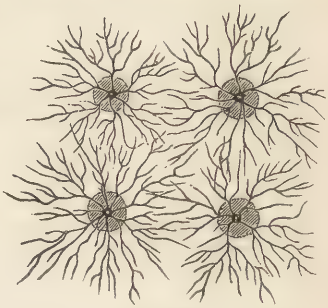


Fig. 105.

already covered the whole surface, and to dig small circles about the tree, as shown by the shaded portions in fig. 105, and the black part in fig. 104, would be to leave the great mass of the roots wholly unreached by cultivation. Dwarf pears, it is true, have shorter roots than most other sorts, but they are still far beyond the effect of these narrow rings.

The mode of pruning has been distinctly described in former numbers of the Register.

VARIETIES.

The older varieties are well known. In making extensive plantations, these should in all cases constitute the largest number, and none of them should be planted in large numbers, which have not been well proved in that particular locality. Some heavy losses have occurred by neglecting this caution.

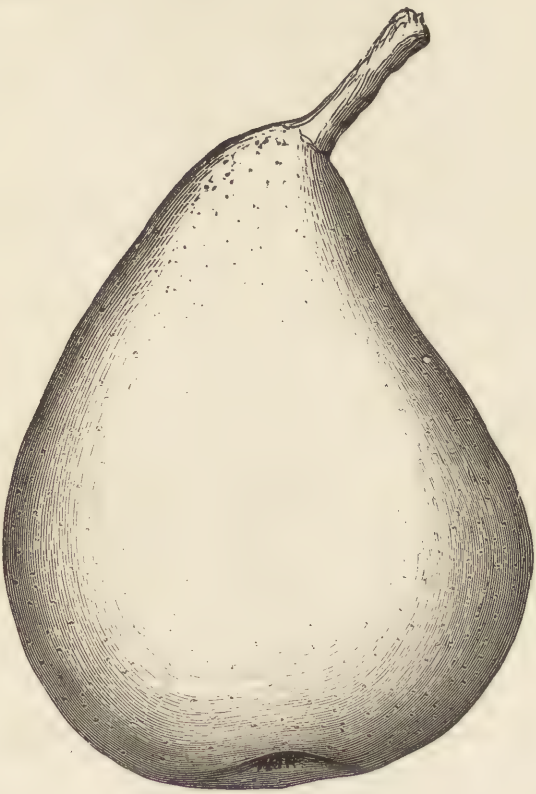


Fig. 106—Beurre Clairgeau.

A list only, of the well-proved varieties is sufficient. Of the newer sorts which promise to be valuable, more particular descriptions will be desirable.

For Pear Stocks exclusively.—The *Bartlett* is perhaps the most certain

and valuable, after which may be named the ***Seckel*, *Sheldon*, *Belle Lucrative***, *Flemish Beauty*, *Lawrence*, ***Winter Nelis.*** The Washington, Autumn Paradise and Beurre Bosc, are fine pears, growing only on pear stocks.

For Quince Stocks exclusively.—Louise Bonne of Jersey, Duchess Angouleme, Beurre Diel, Easter Beurre, Glout Morceau.

Growing well on both Pear and Quince, are Virgalieu or Doyenne, Buffum, Rostiezer, Urbaniste, Winkfield, Tyson, Beurre d'Anjou, Madeleine, Nouveau Poiteau. Belle Lucrative does well for the first ten years.

THE NEWER VARIETIES.—Among the many hundred new sorts introduced and examined of late years, some will doubtless prove of great value. A portion have been tested extensively for several years—others are less known. The great interest felt in relation to these newer sorts, has induced the preparation of the following list.

Beurre Clairgeau.—The large size, great beauty, fine quality, productiveness and *late ripening* of this new pear, and the handsome pyramid it forms on the quince, have given it great celebrity. A want of sufficient hardiness, indicated by the effects of winter, in some localities, has somewhat lessened its high reputation. This defect may, however, on further trial, prove of comparatively small importance.

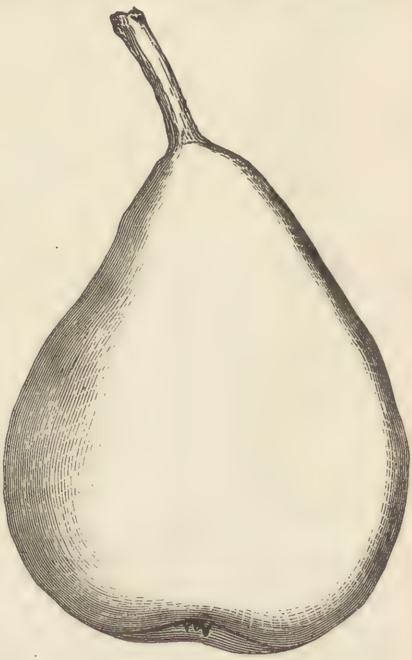


Fig. 107—BEURRE NANTAIS.

It is large, obovate, pyriform, the larger specimens generally distinct pyriform; skin yellow when fully ripe, sometimes nearly clear and smooth, and at other times, and particularly with larger specimens, coarsely dotted, and nearly covered with russet, often with a handsome crimson cheek towards the sun; stalk an inch long, not sunk at insertion; calyx in a moderate basin; flesh buttery and melting, sometimes granular, with

a "very good" perfumed flavor. The quality is somewhat variable —from "good" to nearly "best." On quince, the fruit is of larger size and of better quality than on pear stock.

Beurre Giffard.—Although the growth is slender and straggling, this is one of the best and most valuable of all early pears, ripening immediately after the Madeleine.

Beurre Langelier.—A large, light green pear, becoming pale yellow; fine grained, juicy, melting, with a rich flavor; ripening early in winter. Grows best on quince.

Beurre Nantais or *Beurre de Nantes.*—This pear promises to be of much value. The tree is an erect and vigorous grower, both on pear and quince, comes early into bearing, makes a fine pyramid, and is very productive. It has been cultivated many years in France, its place of origin, but not until recently have its merits become appreciated in this country. It is rather large in size, (the drawing being made from a quite moderate specimen,) pyriform or pyramidal, neck narrow; skin greenish-yellow, with minute dots; stem nearly an inch long, not sunk; calyx in a moderate rather narrow basin; flesh buttery and melting, with a rich, agreeable, perfumed "very good" flavor. Ripens about the middle of autumn.

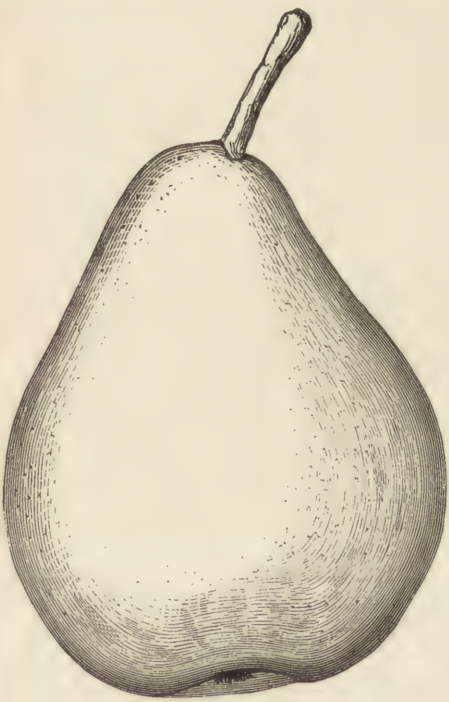


Fig. 108—Comte de Flandre.

Beurre St. Nicholas or *Duchesse d'Orleans.* —A rather large pyriform fruit, and when well ripened, delicious; it is generally regarded as among the most valuable new autumn sorts.

Beurre Sterkman.—Fruit of medium size, short obovate, flesh melting, very juicy, with a rich vinous,

sub-acid, perfumed flavor. Season after mid-autumn. Tree vigorous and productive.

Beurre Superfin.—Size medium, flesh exceedingly juicy, buttery, melting, with a brisk sub-acid flavor. Ripens about mid-autumn. Tree a vigorous and handsome grower, and does finely on the quince.

Brandywine.—One of the finest early pears—size medium, pyriform, partly russeted, flesh very juicy and melting, with an excellent flavor. It forms a fine pyramid on quince.

Church.—A fruit of medium size, the flesh buttery, melting, and with an exceedingly rich, sweet, and highly perfumed flavor, unvarying in quality. It is uniformly productive—a large tree of this variety at New-Rochelle, N. Y., affords fifteen to twenty bushels annually.

Comte de Flandre.—Rather large, pyriform, oblique; skin greenish-yellow, becoming yellow at maturity, with numerous small dots, and marked with thin russet; stem an inch long, set under a lip, with little or no depression; calyx in a shallow basin; flesh very juicy and melting, with an agreeable, refreshing flavor; quality "very good." Tree vigorous and productive. Season late in autumn. Although this pear is hardly so high flavored as some of our finest varieties, yet when well ripened, its juiciness and agreeable aroma render it one of the most delicious sorts.

Des Nonnes.—Of this pear, described by Charles Downing as *Beurre de Brignais*, we have been furnished fine specimens by Thorp, Smith & Hanchett of Syracuse, who have fruited it for several years. Should

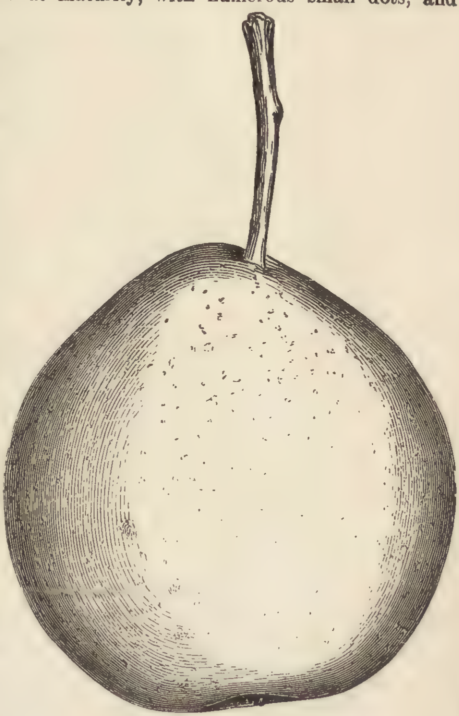


Fig. 109—Des Nonnes.

it prove *always fair*, it will undoubtedly be a great acquisition. They have stated that it is a vigorous grower, good bearer, and that it succeeds finely on the quince. We know of no pear that, all things considered, has a more delicious flavor than the specimens sent us.

In size it is medium—form roundish turbinate, obtuse. Skin greenish-yellow, becoming a clear yellow, with numerous greyish brown dots—sometimes with a faint tinge of red towards the sun. Stalk an inch and a-half long, moderately slender, set in a slight depression. Calyx rather small, often closed, in a small wrinkled basin. Flesh juicy, and exceedingly melting when at perfection, very sweet, perfumed, and with an

Fig. 110—Doyenne Robin.

exquisite flavor—"best." Ripens rather before mid-autumn. It is probable that its extreme delicacy requires that it should not only be well-grown and ripened, to attain its highest perfection, but that the precise point of maturity should be chosen when it shall have attained fully its fine melting texture.

Doyenne d'Alencon, or *Doyenne d'Hiver Nouveau.*—This is one of the

most valuable of all the new winter pears. It is medium or rather large, obovate-pyriform, dull yellow, and when well ripened of excellent flavor.

Doyenne Goubalt.—Size medium or rather large, flattened-obovate and acute, dull pale-yellow, stem short and thick, flesh melting, juicy, with a sweet, rich, aromatic flavor. First half of winter—its value depends on being properly ripened.

Doyenne Robin.—Size above medium, round, nearly regular, or obscurely and obtusely ribbed; skin pale yellow, usually russeted about the crown; stalk an inch and a-half long, generally set in a rather deep smooth cavity, sometimes merely planted on the surface; calyx in a smooth

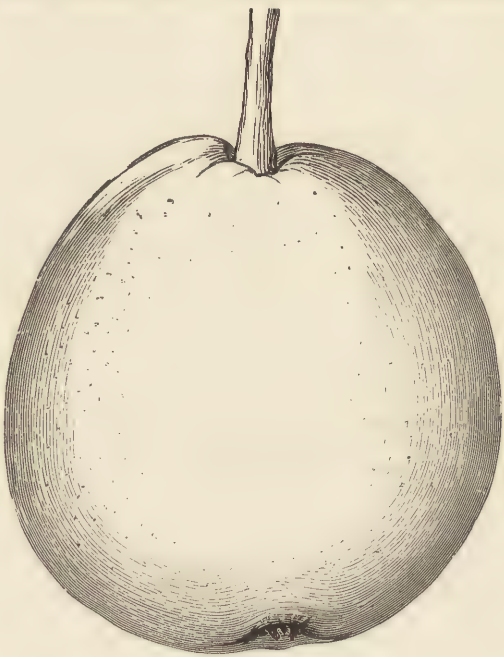


Fig. 111—Doyenne Sieulle.

or scarcely furrowed basin; flesh buttery, slightly melting, with a fine "very good" flavor—not equal to that of the Virgalieu nor so sweet. Tree a free grower and very productive. Season mid-autumn.

Doyenne Sieulle.—This pear, although well-known here for some ten or twelve years to several American pomologists, may properly be ranked among the newer sorts. The tree is an upright and vigorous

grower, and very productive; while its good quality, and period of maturity through the latter part of autumn, and often nearly to mid-winter, render it quite valuable. It is rather large, roundish, slightly obovate; color a rich yellow when ripe, often reddened towards the sun; dots on the surface rather small and not conspicuous; stem an inch and a half long, rather deeply set in a frequently wide and somewhat ribbed cavity; basin quite small, wrinkled; flesh nearly white, fine grained, buttery, with a mild, rather aromatic flavor; "good" or "very good."

Howell.—A large, fair and very productive variety, the tree coming into early bearing, and likely to prove one of the best for market, although the flavor is not often of the highest quality.

Fondante de Noel.—Medium or rather small, obtuse-pyriform, pale greeninsh-yellow, with a red cheek, flesh whitish, melting, juicy, very good. A seedling of the Passe Colmar, ripening earlier, and of similar flavor—a fine late autumn sort.

Josephine de Malines.—Medium in size, sometimes small, flesh melting, juicy and rich—ripens in winter. The tree is vigorous and productive, and forms a fine pyramid on quince.

Laure de Glymes (of Bivort.)—This is a new European variety, which has not yet been much tested in this country, but so far appears to be worthy of attention. It is a good grower on quince, and productive. It is medium in size, conical-obovate, regular, the whole surface nearly covered with a russet, which becomes a rich light orange at maturity—scarcely reddened towards the sun; stem three-fourths of an inch in length, inserted without depression in a fleshy base; calyx moderately sunk in a smooth basin; flesh yellowish-white, slightly granular, buttery, not melting, with a high and somewhat perfumed flavor—quality "very good." It is probable that the quality of this pear may vary considerably, or be found to range, under the various circumstances of cultivation, soil and season, from "good" to "best." It ripens about the middle of autumn, sometimes continuing quite late.

Fig. 112—Laure de Glymes.

Nouveau Poiteau.—A vigorous grower, productive, forming a fine pyramid on quince. Fruit rather large, obovate pyriform, with a juicy and melting texture and fine flavor. This pear promises to be quite valuable.

Ontario.—We have received specimens of this fine new native variety from W. T. & E. Smith of Geneva, N. Y. It is a vigorous and productive sort, and promises to be valuable for market. The quality is "good" or "very good"—not quite equal to the Virgalieu or Doyenne in its high aromatic flavor, but well-grown and well-ripened specimens are not much inferior. In form it considerably resembles the Bartlett, but is of smaller size, and we are informed it is a seedling of the Canandaigua; if we were to guess its origin, without any knowledge except from the specimens, we should think it was a cross from the Bartlett and Doyenne.

Fruit medium or rather large, oblong-pyriform, sometimes very faintly and obscurely ribbed, and generally somewhat irregular. Skin pale yellow, with numerous very small dots. Stalk about an inch long, mostly curved, with a fleshy ring at base, and inserted in an irregular depression. Calyx open or partly closed, in a wrinkled basin. Flesh white, buttery, becoming melting, with a rather sweet, mild, pleasant, agreeable flavor. Ripens a little before mid-autumn.

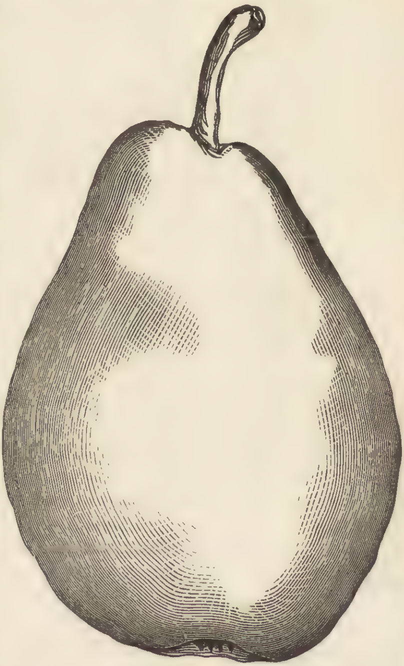


Fig. 113—Ontario.

Sheldon. — Medium to large, roundish-obovate, very obtuse; skin pale green russet, becoming a rich brownish russet; stalk short, stout, flesh very melting and juicy, with a high, rich, peculiar, and excellent flavor. One of the most valuable of all new pears. Middle and late autumn. Origin, Wayne county, N. Y.

Theodore Van Mons.—Medium to large, obovate-pyriform, regular, greenish-yellow, more or less covered

with distinct patches of russet; stem an inch long, scarcely sunk; calyx large, open; (basin, none)—sometimes closed in a small basin; flesh granular, juicy, and melting—sometimes slightly astringent Varying from "good" to "very good." This pear is likely to prove valuable on account of its vigorous growth and great productiveness, when worked on pear or quince.

Van Assche, or *Van Assene.*—Rather large, conic-obovate, yellow, with a fine touch of red; flesh juicy, melting, and often excellent. Tree vigorous and productive. Middle and late autumn.

Walker.—Fruit large, long pyriform, flesh rather coarse, rich, with a peculiar almond flavor. The last half of autumn.

Zepherin Gregoire.—Inferior to some as a fine grower, but marked for the high excellence of its quality. It is very productive—the growth of the tree rather slender. Its lateness,—ripening through the latter part of autumn,—increases its value. It is medium in size, roundish-obovate, light green, reddened when fully exposed to the sun; stem an inch and a-fourth long, fleshy at insertion; calyx open, in a narrow basin; flesh buttery, very melting, fine-grained, with an excellent perfumed flavor—"best."

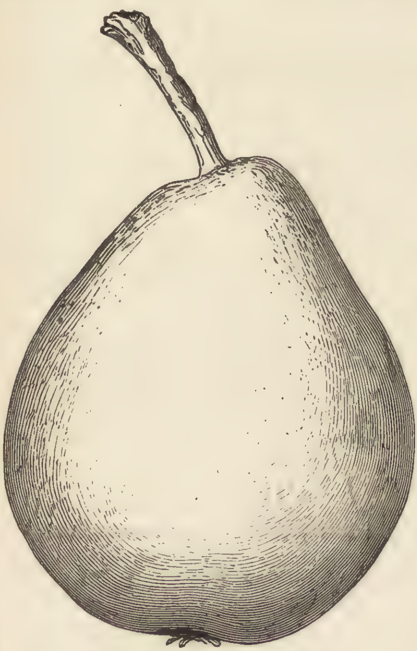


Fig. 114—Theodore Van Mons.

Pears Ripening in Succession.—The following list will give a continued supply, beginning to ripen in the Northern States at mid-summer, and continuing through summer, autumn and winter, into spring: Madeleine, Doyenne d'Ete, Skinless, Giffard, Bloodgood, Osband's Summer, Rostiezer, Tyson, Brandywine, Kirtland, Bartlett, Washington, Andrews, Bilboa, Belle Lucrative, Buffum, Seckel, Flemish Beauty, Stevens' Genesee, Howell, Urbaniste, Beurre Bosc, Autumn Paradise, Louise Bonne of Jersey, Beurre d'Anjou, White and Gray

Doyenne, Sheldon, Beurre Diel, Noiveau Poiteau, Lawrence, Sieulle, Winkfield, Beurre Clairgeau, Beurre Langelier, Columbia, Josephine de Malines, Winter Nelis, Prince's St. Germain, Beurre Gris d'Hiver Nouveau, Doyenne d'Alençon, Easter Beurre.

VARIETIES OF THE PEAR MOST LIABLE TO FIRE-BLIGHT.—*Madeleine*, *Bartlett*, *Passe Colmar*, *Stevens' Genesee*, and *Glout Morceau*, and *Winkfield* while young. Among those least liable, the *Seckel* stands at the head, and the following are less liable than those first named: *Louise Bonne of Jersey*, *Angouleme*, *Flemish Beauty*, *Sheldon*, *Virgalieu*, *Easter Beurre*. All are, however, more or less affected in different places, and sometimes the order here given is reversed.

VARIETIES WHICH DO NOT CRACK.—The cracking of some sorts is becoming a formidable evil. It becomes, therefore, desirable to select those least affected. At a large pomological meeting held at Buffalo in 1857, none had ever known the *Lawrence*, *Doyenne d'Hiver*, *Bartlett* and *Ananas d'Ete* to crack. Only one had seen the *Angouleme* and *Louise Bonne of Jersey* affected. The *Flemish Beauty* was rarely injured.

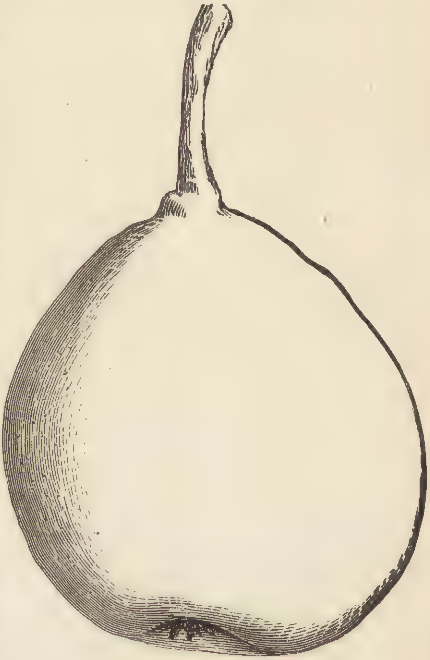


Fig. 115—ZEPHERIN GREGOIRE.

GATHERING, KEEPING, AND MARKETING PEARS.—Some cultivators have been greatly disappointed in the deficient quality of their fruit; and others, who raise for market, at the low price received. This disappointment results either from the careless manner of gathering, from improper ripening, or from a bad selection of a purchaser or dealer. Nearly all varieties should be picked several days before fully matured, in order to secure the best flavor and appearance. The utmost care must be taken to avoid bruising, for indented spots will nearly destroy their sale. The Bartlett and some other sorts, if gathered a

week or more before maturity and kept in a dark place, will become marked with a fine red cheek, adding much to their attractive appearance; while they would only present the common yellow skin if ripened in the light. Some varieties depend almost wholly on the best mode of ripening, for perfecting their flavor, without which they would be nearly tasteless. This has been especially the case with *winter pears*. Some of these, being kept in too warm a place before the proper period of maturity, ripen too soon, and mid-winter varieties become soft by the close of autumn. Others are withered while yet green, after which they never can become excellent. This difficulty is partly owing to imperfect development in growth in consequence of neglected cultivation. The very best treatment must be given to the trees of winter varieties. And the fruit-room must be cool, and neither too damp nor too dry. As the period of maturity approaches, they are to be placed in a warmer apartment. Great care has been taken by some cultivators to keep their pears in drawers or on shelves, in single layers; but of late years more success has resulted from packing away in tight barrels, as practiced for winter apples. They are not then subjected to the changes effected by currents of air, nor changes of humidity. The apartment must, however, be quite cool. In some instances they have been very successfully kept in the center of barrels, surrounded with apples. All bad odors should be carefully excluded; excellent fruit has sometimes been ruined by them. Wrapping them separately in paper or cotton, is found to abstract a portion of the flavor. John Gordon, a very successful pear-raiser near Boston, finds that *woolen cloth*, placed between the successive layers of the fruit, assists most perfectly in ripening. His general skill in the process of maturing, together with his excellent cultivation, enables him to sell Bartletts at ten dollars per bushel, while his neighbors, with ordinary management, received but three dollars.

Those who send fruit long distances to market, should be careful to have it packed when sufficiently hard to endure the journey before softening; to pack it tight in barrels or boxes, with coarse and elastic matting around the interior, so as completely to prevent rattling; and to consign them to a commission salesman of character and responsibility, who understands his business thoroughly, who knows when the right period of maturity has arrived, and who can dispose of them to the best advantage.

Selection of Cherries.—P. Barry, one of the four greatest American pomologists, made the following selection of cherries, at the meeting of the Fruit Growers' Society at Rochester in 1858: *Early sorts*—Early Purple Guigne, Belle d'Orleans, Gov. Wood, Mayduke, Black Tartarian and Black Eagle. For a late sort, Reine Hortense, and very late, Belle Magnifique. For market, he would add Napoleon, Rockport Bigarreau and Elkhorn.

PEACHES.

The following selection of the most highly esteemed varieties, will furnish a succession lasting about two months:—Serrate Early York, Cooledge's Favorite, Large Early York, Crawford's Early, Nivette, Oldmixon Free, Bergen's Yellow, Druid Hill, Crawford's Late, and Heath Cling. The last named, (in the Northern States,) if picked just before frost, and kept on shelves in a cool room, will remain in good eating condition for some weeks, and specimens have been kept till winter. Crawford's Early is the most reliable for uniform and good crops through different seasons, and Cooledge's Favorite has been found remarkable for its hardiness.

There are other varieties, ripening at the same time as some of the above, and nearly or quite as good in quality, which might be substituted for them. For example, the Early Tillotson is quite as early as the Serrate Early York, and in some localities, particularly in the Southern States, is higher in flavor and more valuable. George the Fourth and Grosse Mignonne ripen nearly with Large Early York. Morris White ripens at the same time as Nivette.

PLUMS.

The following valuable or excellent old and new varieties, are carefully arranged according to their order of ripening, and they furnish a succession of fruit from the middle of summer until after the middle of autumn, or for about three months.

Primordian—small, yellow, flavor moderate, tree a slow and slender grower, but good bearer; valuable for its extreme earliness, ripening a little before the usual time of harvesting wheat.

Imperial Ottoman and *Royal Hative*, are very early plums, of medium size, and good quality.

Peach Plum, a very large and showy variety, of second quality.

Hudson Gage, a new sort, of medium size, and of a rich and fine flavor, the tree thrifty and productive.

Prince's Yellow Gage, remarkable for its hardiness and productiveness, the fruit above medium size, and usually juicy and with a fine flavor.

Duane's Purple, a very large and showy fruit, but of second-rate quality.

Green Gage, well known for its unequalled flavor, the tree a slow grower; *Lawrence*, a large, green, and excellent plum; and *Red Gage*, a very productive and fine medium-sized plum, all ripen about the same time. The *Lombard*, a very hardy and reliable sort, of good quality, is scarcely later.

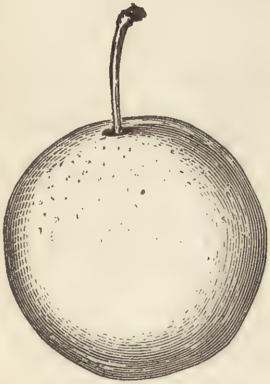


Fig. 116—Imperial Ottoman.

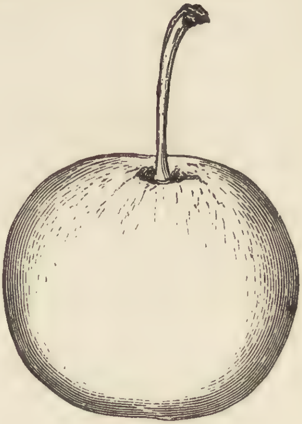


Fig. 117—McLaughlin.

Washington, very large and showy when well-grown, is a great and general favorite, but a serious drawback on its value is liability to rot on the tree.

Smith's Orleans immediately follows the Washington. It is a large, oval, purple fruit, and the tree is

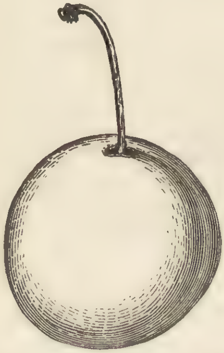


Fig. 118—Schenectady Catherine.

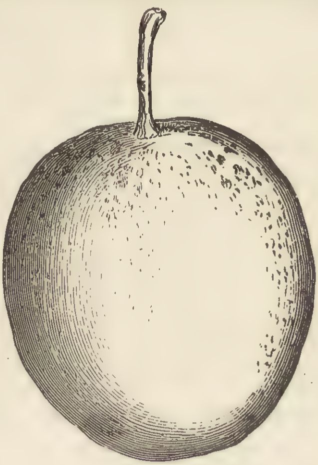


Fig. 119—Fulton.

remarkable for its productiveness, hardiness, and vigorous growth.

Jefferson, a large, handsome, and excellent variety, follows next in succession.

Bleecker's Gage, a productive and reliable plum; *Red Diaper*, large,

showy, and excellent, but a slow grower; and *Columbia*, a very large, handsome and showy, but rather coarse plum, all ripen together. Nearly at the same time is the

McLaughlin, one of the finest of all the new plums, the tree being vigorous and very hardy, and the fruit large, and scarcely inferior in delicious quality to the Green Gage.

The *Imperial Gage*—well known for its rapid growth and enormous productiveness; and the *Bingham*, a large, handsome, productive and excellent plum, ripen about the same time or immediately after the preceding several sorts.

The *Schenectady Catherine* is small in size, but is valuable for its excellent quality and profuse productiveness, but more particularly for the extreme hardiness of the tree and its endurance of severe winters.

Reine Claude de Bavay, one of the best new late varieties, productive, and a vigorous grower.

Coe's Golden Drop, a very large and excellent plum, but requiring a warm season to ripen it at the north.

Fulton, a new variety, large, of a rich, high flavor—the tree vigorous and productive, and the fruit hanging long after ripe.

Coe's Late Red, a good, late, medium-sized plum, tree thrifty and prolific.

THE STRAWBERRY.

Transplanting Strawberries.—The best time is always early in spring, as, at that time, we have only to set out the plants with ordinary care, for all to grow. They will bear abundantly the second season, and if kept clean and cultivated, for two or three years afterwards. If allowed to run the season of transplanting, and not cultivated except in the early part of the season, they will give a full crop the next year, but not afterwards. Some good cultivators think it best and most economical of labor to plant a new bed every year, and to let the bed run full of plants, for only one year's bearing. They find it easier to plant out a new bed in spring, than to cultivate the old one through the season. The crop is not, however, so fine, when thus treated.

Transplanted immediately after bearing, and while the plants are somewhat exhausted and consequently in a partially dormant state, strawberries will do well, and afford as good a crop next season, as by spring transplanting, but more care and labor are required. The ground is first to be prepared by properly enriching it, and making it clean and mellow. The amount of manuring must depend greatly on the previous character and condition of the soil. If naturally fertile, and if it has been well previously manured, little need be applied; if not largely composed of

Fig. 120—Hooker Strawberry.

vegetable matter, a quantity of leaf-mould or well-prepared peat will be found very useful. Where much manure is needed, a compost with a large proportion of such vegetable matter is always best.

The plants should be selected from the youngest well-rooted runners of the previous year. They should be lifted out with a spade and the earth shaken off, and not *pulled out*, as is often done to the injury of the roots. All the fully expanded leaves are to be clipped off, leaving only the small, half-open ones. The roots are then to be dipped in mud made in a pan or pail for this purpose, thick enough to leave a coating on them about the fourth of an inch. They are then to be transplanted, spreading out the fibres as much as may be convenient, and taking care not to cover the crown. If the soil be dry, they should all be watered heavily, and an inch of mellow earth drawn over the watered surface, to fill up the settled earth. A mulching is then to be applied about an inch or an inch and a-half thick, of fine, partly-decayed stable manure. This will prevent

Fig. 121—Wilson's Albany Strawberry.

the surface from drying and becoming hard and crusted; and if watering should afterwards be necessary, which, however, can only happen in extremely dry weather, this mulch will keep the surface moist and in proper condition. Treated in this manner, all or nearly all the plants will live, and furnish an abundant crop next year.

THREE NEW STAMINATE STRAWBERRIES.

The opinion of some eminent strawberry cultivators, that pistillate varieties only can be relied on for uniform productiveness, is now fully disproved. Two new profuse-bearing staminate sorts of great size, have been produced within a few years, that are likely to supersede all preceding ones. These are the *Wilson*, which is perhaps the most prolific of all known strawberries, and the *Hooker*, superior in quality, but less

hardy than the Wilson. They have been already briefly described by Charles Downing and some other writers.

The size given in the accompanying engravings, is the result of exact measurement of the fruit as grown in Western New-York, with ordinary cultivation. Unusual care would doubtless afford larger berries.

The HOOKER strawberry varies in size when fully grown, from an inch to an inch and a-third, and sometimes an inch and a-half in diameter; it is roundish and obtuse-conical, the berries remarkably well filled out in every part, very dark crimson, flesh soft and juicy, with a sweet and excellent flavor. Staminate (or hermaphrodite) and uniformly a great bearer. The writer has picked berries an inch and a-third in diameter, from plants set out seven weeks previously. It has two drawbacks—its softness,—unfitting it for distant marketing,—and its tenderness, resulting from the protrusion of the crowns of the young plants above the surface of the earth, but which rarely causes their destruction. It is destined to supersede wholly Burr's New Pine and other sorts, hitherto so largely raised for family use. Origin, Rochester, N. Y.

WILSON'S ALBANY is not less in size than the Hooker; it is extremely hardy, the plants early in spring presenting a remarkably deep, healthy green; and is unequalled for its crops, in the several places hitherto tried, both in the State of New-York and further west. Two or three hundred bushels of fruit might unquestionably be raised on a well-cultivated acre. The berries are roundish-conical, sometimes roundish-oblate, and occasionally coxcombed, full and obtuse, dark crimson, moderately firm, but becoming tender when fully ripe, flavor very good, but not of the highest excellence. Probably the most profitable market sort at present known. Crops, that for other sorts would be considered good, have been produced seven weeks from the time of setting out in spring. Origin, Albany, N. Y.

122—PEABODY STRAWBERRY (as grown in western N. Y.)

Both of these varieties being staminates, are self-fertilizers, and save much of the trouble usually resulting from the necessity of mixing staminates with pistillate sorts, such for example, as Burr's New Pine, Hovey's Seedling, Hudson, Crimson Cone, McAvoy's Superior, &c.

PEABODY'S STRAWBERRY.—As far as size and flavor are concerned, this renowned new sort

is not a humbug, as many have feared. The figures are the exact size of specimens grown with ordinary care, and we think the quality unexcelled by any other sort. It is oblong-conical, often coxcombed, deep crimson, flesh firm, very sweet and high-flavored, and appears to keep longer after picking than other varieties. The plants have proved quite hardy at the north, but we fear it will be found too unproductive to be of much value. Origin, Columbus, Georgia. It is sometimes termed "Peabody's Hautbois," from the faint shade of the Hautbois flavor which the berry possesses; but it does not in the least resemble the Hautbois in any other particular.

In addition to the preceding, the following new sorts may prove valuable:—*Jenny Lind*, for its extreme earliness; *Genesee*, for its good size and fine appearance; *Triomphe de Gand*, very large and showy, but a moderate bearer. Scott's Seedling is large, showy, and productive, but is deficient in flavor—the same remark applies to the Cushing.

At the summer meeting of the Fruit Growers' Society of Western New-York, in 1858, twelve strawberry-growers voted for the five best, with the following result:

For Amateurs—Hooker, 12 votes—Large Early Scarlet and Burr's New Pine, 7 each—Hovey's Seedling, 5—Wilson's Albany, 4—Jenny Lind, McAvoy's Superior, Triomphe de Gand, Peabody, and Trollop's Victoria, 2 each.

For Market—Large Early Scarlet, 8 votes—Crimson Cone and Wilson's Albany, 7 each—Genesee, 5—Hovey's Seedling and Hooker's, 4 each —Cushing, Scott's Seedling, Longworth's Prolific, Iowa, and Burr's New Pine, 2 each.

HARDY FRUITS AT THE WEST.

The late intensely severe winters in the western States, have performed a very useful and important service. By cutting off all tender varieties of fruits, they have furnished a list of the most hardy, such as may be relied on for endurance in future years, and they have performed this task at the very commencement of extensive plantings, when the knowledge thus given is especially needed.

Single experiments do not establish a rule; as a variation in exposure, in fertility of soil, in the thriftiness of growth, and especially in drainage, may all give quite different results with the same sort. But a variety that is frequently killed, cannot be regarded as reliable; and one which under all circumstances escapes unhurt, may from its entire hardiness, be extensively planted.

The following lists were recently furnished by intelligent western correspondents, from which a general summary of results is made, and

which cannot fail to be valuable to all those who are about to set out orchards in the west.

APPLES.

I. C. ALLEN of Lena, Ill., furnishes the following results of his experience. *Very hardy* — Oldenburgh, Late Strawberry. *Hardy*—Early Joe, Early Pennock, Sops of Wine, Cooper, Fulton, Fall Orange, Mother, Fallawater, Hubbardston Nonesuch, Jonathan, Limbertwig. *Tender*—Early Harvest, Summer Bellflower, Belmont, Hawley, Jersey Sweeting, Rambo, Twenty Ounce, Baldwin, Domine, English Russet, King, Newtown Pippin, Golden Sweet.

E. ORDWAY of Freeport, Ill., gives the following list of such varieties as have withstood the late severe winters there: Tallman Sweeting, Yellow Bellflower, Seeknofurther, Golden Russet, Northern Spy, White Winter Pearmain, Winesap, Fallawater, Maiden's Blush, Red Canada, Sops of Wine, and Large and Small Romanite.

SAMUEL EDWARDS, La Moille, Ill., gives the following as the most hardy and valuable:—Red June, High-Top Sweeting, Hocking, Early Pennock, Keswick Codlin, Maiden's Blush, Fameuse, Westfield Seeknofurther, Yellow Bellflower, White Winter Pearmain, Fulton, Red Romanite.

Dr. S. L. PENNINGTON, Sterling, Ill. *Hardy*, or but slightly injured—Yellow Bellflower, Westfield Seeknofurther, Fameuse, Black Detroit, Winesap, Pomme Grise, Lowell, Red June, Willow Twig, Early Nonpareil. *Tender*—Baldwin, Porter, Rhode-Island Greening, Roxbury Russet, Ortley, Sweet Bough, Rambo.

E. H. SKINNER, McHenry Co., Ill. For *summer*—Red Astrachan and Carolina Red June. For *autumn*—Porter. *Early winter*—Fameuse. *Winter and spring*—Jonathan, Rawles' Janet, English Russet.

J. S. SHERMAN, Rockford, Ill. Sweet June, Baldwin, Tompkins County King, Wagener, and most of the hardiest in Western New-York, except Rhode-Island Greening and Sweet Bough. Maiden's Blush and Yellow Bellflower succeed admirably.

B. W. STEERE of Adrian, Mich., mentions as particularly *tender*, English and Roxbury Russets, Gravenstein, Baldwin, and Rhode-Island Greening—the latter becomes hardier with age, but is an uncertain bearer.

AMASA STEWART of Le Seur, Minnesota. Early Harvest, Early Strawberry, Red Astrachan, Maiden's Blush, Fameuse, Harrison, White Bellflower. The Rambo was tender.

F. K. PHŒNIX, Bloomington, Ill., who has also made extensive observations in Wisconsin, names the following hardy apples: *Summer*—Carolina June, Sweet June, Red Astrachan, Sops of Wine, Benoni, Summer Pearmain. *Autumn*—Autumn Strawberry, Dyer, Fall Orange, Haskell Sweet, Gabriel, Northern Sweet, Oldenburgh, St. Lawrence. *Winter*—Yellow Bellflower, Carthouse, Limbertwig, Romanstem, White Winter Pearmain, Seeknofurther, Tallman Sweet, Winesap, Monstrous Pippin, English Golden Russet, Willow Twig, Winter Sweet Paradise, Campfield Sweet.

OHIO POMOLOGICAL SOCIETY, 1857, from the report of various members: Carolina Red June, fine in central Indiana, poor in southern Michigan; Late Strawberry, good in Ohio, Indiana and Illinois; American Summer Pearmain, generally and highly esteemed; Hawley, promising well; Maiden's Blush, everywhere hardy and productive; Fallawater, second quality, but everywhere valuable; White Pippin, one of the best for central and southern Ohio; White Winter Pearmain, highly prized in Indiana and Illinois, unknown in Ohio; Pryor's Red and Rome Beauty, southern Ohio; Red Canada, northern Ohio. The following sorts have generally done well: Winter Sweet Paradise, Broadwell, Tallman Sweet, Danvers Sweet. The Northern Spy had done well in Kentucky, St. Louis, and Indiana, although diminished in keeping qualities.

In adition to the preceding lists, the following has been furnished by M. R. PATRICK of Sackett's Harbor, N. Y., a place remarkable for its intense winters and severe winds. *Vigorous growers and perfectly hardy*—Hawthornden, Sops of Wine, Late Strawberry, Jewett's Red, Orne's Early. *Nearly as hardy*—Early Harvest, Summer Queen, Fall Orange, Hawley, King (Tompkins,) American Golden Russet, Swaar, Benoni, Red Astrachan, Ribston Pippin. *Somewhat tender* — Rambo, Dyer, Gravenstein, Fameuse. *Half hardy*—Jonathan, Domine, Sweet Baldwin, Danvers Sweet, Belmont, Canada Reinette, Yellow Bellflower. *Tender*—Baldwin, Twenty Ounce, Tallman Sweet, Fall Pippin, Sweet Bough, Summer Rose, Early Strawberry, Early Joe, Jersey Sweet, Oldenburgh, Roxbury Russet, (very poor,) Westfield Seeknofurther, Ladies' Sweet, Esopus Spitzenburgh, Porter, Lowell, Lady Apple, Newtown Pippin, English Russet, Northern Spy, Red Canada, Rhode-Island Greening, Peck's Pleasant.

From the preceding lists, it will be seen that the following have proved hardy wherever tried, without exception, viz: *Sops of Wine, Late Strawberry, White Winter Pearmain, Winesap, Fall Orange, Fallawater, Maiden's Blush, Carolina June, and Red Astrachan.* These sorts

may therefore be planted without fear of cold winters. The vote was *nearly* unanimous for *Fameuse*, *Yellow Bellflower*, *Westfield Seeknofurther*, *Jonathan*, and *Oldenburgh*.

PEARS.

B. W. Steere, Adrian, Mich., gives the following list: *Tender*—Bartlett, Seckel, Winkfield, Oswego Beurre; *hardy*—Flemish Beauty, Tyson, Rostiezer, Doyenne d'Été, Beurre d'Anjou, Belle Lucrative, Onondaga, and Lawrence.

The *Ohio Pomological Society*, in its Transactions for 1857, gives from the report of some of its members, the following *pears* as having proved valuable at Cincinnati: Walker, Fontenay Jalousie, Andrews, Gray Doyenne, Urbaniste, Belle Lucrative, Flemish Beauty, Kirtland, Doyenne Sieulle.

I. C. Allen of Lena, Stephenson Co., Ill., furnishes the following list of pears, the results of his experience in that region. *Very hardy*—Flemish Beauty. *Hardy*—Buffum, Columbia, Dix, Winter Nelis, Forelle, Fulton, Lawrence, Osband's Summer, Oswego Beurre, Onondaga, Stevens' Genesee, Susette de Bavay. *Half-hardy*—Doyenné d'Été, White Doyenné, Easter Beurré, Glout Morceau, Bilboa, Henry IV, Seckel, Tyson, Bergamotte Cadette, Aremberg. *Tender*—Bartlett, Belle Lucrative, Beurre d'Anjou, Beurre Bosc, Catillac, Chaumontelle, Dearborn's Seedling, Angouleme, Louise Bonne of Jersey, Madeleine, Vicar of Winkfield, Van Mons' Leon le Clerc.

CHERRIES.

The dukes and morello cherries, such as Early Richmond, Mayduke, Belle Magnifique, Belle de Choisy, Morello, &c., all succeed well at the west; while the Heart & Bigarreau varieties generally fail.

SMALL FRUITS.

Currants, Houghton's Gooseberry, and the smaller fruits generally, succeed well throughout the west.

RENOVATING OLD TREES.

When old trees become feeble, there is no better way of imparting to them vigor, than by *manuring*. Instead of adopting the more common practice of digging a circular trench around them and filling this with manure, the operation may be performed in a more perfect and efficient manner by digging narrow radiating trenches from within a few feet of the trunk, directly from it—this will prevent cutting many of the roots. The annexed diagram (fig. 123) will show the position of these trenches. These may then be filled with a *compost*, made of turf, stable manure, ashes, and perhaps a little bone manure—the turf to be the chief constituent, say one-half or two-thirds—and the ashes say one-thirtieth. The bone manure is not essential, as its constituent parts are in common manure in small quantities. If this is done in autumn, the roots will be prepared to penetrate it early in spring, and if the tree is not past recovery, it may make a new push. The roots probably extend as far each way as the height of the tree, and the trenches should extend about as far. They need not be cut very near the tree, as the roots are all large there, and would be more likely to be injured and would be little benefitted. The trenches should be only the width of a spade, and may be two to four feet apart.

Fig. 123.

PRESERVING FRESH FRUITS.

THE YEOMANS FRUIT BOTTLE.

In answer to the frequent inquiries that are made for the best mode of preserving fresh fruits in cans, jars or bottles, the following directions have been furnished by T. G. Yeomans of Walworth, N. Y., who, besides being a very skillful and successful cultivator of fruits and fruit trees, has for several years given special attention to the subject. Having used his bottles, we find them exceedingly convenient and just the thing wanted. He states in a recent letter, (and his statements can be fully relied on,) that in the sale of many thousands of dozens of these bottles, so far as he knows, "they have given universal satisfaction." The following is his statement of the advantages of this fruit bottle:

1st. It is made of glass, and will not corrode and poison the fruit; and being transparent, the condition of the fruit can at all times be seen, while they are so easily cleansed, that they are as good as new for succeeding years.

2d. It is more readily sealed up securely, than any other can, jar or bottle.

3d. The shape of the neck is such that the cork cannot be forced in by the atmospheric pressure on it, caused by the cooling and consequent contraction of the fruit in the bottle; and also with a neck of such length that the contraction will not bring the fruit below the neck, so that if there should be, as there

Fig. 124—Tunnel.

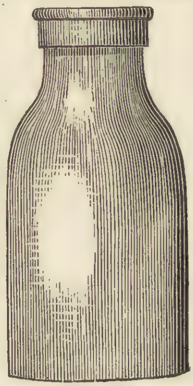


Fig. 125—Fruit Bottle.

sometimes will be, a slight mold on the surface, the surface being so small, very little fruit would be thus injured, and that little could be very easily removed; while the shape of the bottle below the neck is of such a taper, that the fruit comes out readily.

4th. It is cheaper than any other bottle, jar or can of merit, that has

yet been brought before the public, and *so cheap* as to be within the reach of all.

Directions for Using and Filling.—Cook or stew the fruit in its own juice, with water enough only to keep from burning it, with sugar enough only to flavor it to the taste—or omitting the sugar entirely till opened for use, as you please—until it is cooked through in every part, keeping it well covered while cooking; then with a small dipper or large spoon, and a tunnel for the purpose, fill the bottle, which should be standing in a pan of warm or hot water, to prevent its breaking; when full, immediately cork by pressing the cork down to the jog in the neck, then with an iron spoon, or any thing else, rub a little wax over the surface of the cork, and soon after dip the top of the bottle into the hot wax, which completes the sealing. The twine that goes under the cork should be bent down on the cork, and sealed under, to prevent, by any possibility, air from passing down by the twine. Keep in a cool, dry place.

Such fruit as is naturally too dry to afford juice enough to cover it when cooked, or such as are too hard and firm to sweeten conveniently without cooking in the sugar, are best put up with sugar enough to flavor them, which at the same time furnishes juice or syrup to cover the fruit in the bottle—which, when fully covered, is less liable to mold on the surface.

To avoid mold entirely, the bottle may be inverted occasionally, and most frequently for a few weeks after putting up.

Wax for Sealing.—An excellent sealing-wax is cheaply made of about one pound rosin to an ounce of tallow, to give it toughness.

Corks, &c.—Corks to fit, (furnished, when ordered, at $1.50 per gross,) are used by putting a small, stout twine, double, across the mouth of the bottle when corking—by these the cork may be easily extracted without injury, and kept for future use.

The bottles are of two sizes, holding about one and two quarts, and are put up in boxes of twelve dozen for the one-quart bottles, and six dozen for the two-quart, and sent safely to any distance. Wholesale prices are furnished by the inventor, T. G. Yeomans, Walworth, Wayne Co., N. Y.

KEEPING GRAPES THROUGH WINTER.

It is important that they be kept in a *cool* place; a slight frost will not injure them if they have become *fully ripe.* Bunches with green stems are not ripe, and may be spoiled by freezing. Cut the stems in picking, handling the bunches as little as possible, and remove every imperfect or decayed berry. Place them in broad shallow boxes about six inches deep, with a white sheet of unsized paper on the bottom and between each layer of grapes. Set the boxes uncovered in a dry open place for about ten days,

till all the surplus moisture has evaporated—this will prevent future molding and decay, and is very important. Then cover the boxes with covers which have been previously made to shut tight. Place them in a cool cellar, or in a garret not subject to severe frost, and they will keep till spring as fresh as when packed away.

A convenient size for the boxes is two feet square, and six inches deep. These are rather better than tubs made from barrels cut in two, by allowing the moisture more readily to escape. Baskets for packing should be avoided, as by yielding, they bruise the fruit. A convenient way for gathering is to suspend a light shallow box, holding about a half bushel or less, by means of a strap to the neck, leaving both hands at liberty. In this box they may be carried to the place of packing.

To send grapes long distances, pack them closely, without any intervening substance, in pasteboard boxes, so as not to shake or rattle. The boxes should hold about half a peck each. In this way they may be carried safely a thousand miles.

RAISING AND KEEPING CELERY.

P. Henderson of Jersey City, who raises celery largely for market, adopts the following mode, dispensing with a hot-bed. The seed is thinly sowed early in spring, on a very rich, mellow, and perfect piece of land—they are well cultivated and thinned, and afford fine healthy plants by the first of 7 mo. (July.) They are always transplanted in rain, to rich land. Those intended for autumn use (blanching on the ground,) are in rows four feet apart (to allow banking up,) and five or six inches in the row—on the surface and not in trenches. For winter and spring use, the rows are three feet apart. They are well cultivated with a horse and by hoeing.

When about half grown, or about the end of summer, a little earth is drawn to them to give them an upright position. After that, the plants are held closely together with one hand, and additional earth applied. In a few weeks more, they are banked up by digging the earth between the rows.

That intended for winter use, is packed away in trenches about a month before winter sets in. For early winter, the plants are removed a week or two sooner, and without shaking the earth from the roots. For later use, they are taken up a little later, and packed more closely. The trenches are not over eight or ten inches wide—if wider they promote fermentation and decay. After they are filled, the soil is pressed closely on each side, by thrusting a spade down, but leaving the green tops exposed. About the first of winter, the whole is covered with about six inches (or more) of stable manure or leaves.

APPLE-SEED WASHER.

Nurserymen and others often inqure for the best mode of washing apple-seed from the pomace. The following, adopted by J. M. Mattison, is one of the best, by which two men will wash half a bushel of seed or more in an hour:

Make a box 5 feet wide, 8 or 9 feet long, and 10 inches deep; leave the lower end *f*, one inch lower than the sides, for the water to flow over. Place this box in the bed of a brook or stream, on crossbars or scantling, with a dam above to collect the water into a trough, carrying the water into the box, and projecting six inches over it. This trough should be made of boards 12 inches wide, nailed together, and the stream should be large enough to nearly fill it when flowing gently. To prevent the water from dashing into the box too furiously, two boards are first nailed together as shown at *b*, one board being 18 inches by two feet, and the other 18 inches by 1 foot. The longer board is placed on the top of the spout, and the shorter at right angles across the lower end of the spout. This serves to throw the water perpendicularly downwards into the box, and at the same time serves to spread it out into a thin sheet. By moving this board up or down the spout, the quantity of water pouring into the box may be easily controlled.

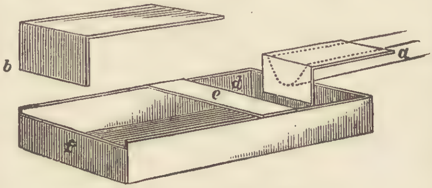


Fig. 126—Apple-Seed Washer.

One man stands on the board *e* which extends across the box; and the other carries and deposites the pomace (well pounded to pieces,) into the box at *d*, one or two bushels at a time. The man on the box then stirs the pomace rapidly with a four-tined fork, and throws out the straws. The pomace floats over the lower end(which is an inch lower than the sides) and the seeds fall to the bottom. A few back strokes from the lower end of the box assist in the separation of the remaining pomace. In washing a "cheese" that contains a bushel of seed, it is usual to wash it two or three times, by using a scoop-shovel. Afterwards, the last cleaning process is given to it by placing the whole in a box, and then scratching a four-tined fork through it a few times. A little experience will enable any one to judge accurately of the proper quantity of water to turn on, so as to make rapid work, and not carry the seed over the box.

The pomace, *fresh* from the cheese, should be drawn and placed on a board-platform beside the box, and then plenty of water thrown upon it, until it is thoroughly soaked. This will render it easily beaten to pieces with a hoe. The pomace should never remain in the cheese over twenty-four hours, as it soon ferments and the seed is spoiled.

Protecting Young Fruits.—Hardy as well as tender strawberries should be covered for winter, because if hardy they will make an earlier start, and ripen their crops sooner; and if tender will often escape destruction. Coarse litter is good, but evergreen boughs are better. Trimmings of nursery trees spread over the bed and covered with straw, make a good protection and give the plants more air. The cultivated raspberries and blackberries need protection, where the largest and earliest crops are desired. The latter may be most readily covered with two inches of earth, first bending and pegging them down; and to prevent breaking, making a small mound of earth against the foot of the stems, of which only five or six of the best should be left in each stool.

NURSERIES

OF THE UNITED STATES AND CANADA.

No part of the following is copied from other lists of nurserymen previously published, but it is wholly made up from an extensive correspondence. In most cases the information it contains was derived from the proprietors themselves. Their statements, when examined, have in nearly all instances been found correct, and the list is therefore believed to be unusually accurate. There may be a few good nurseries contained in other lists, which are omitted in this; but there are also a great number excluded which are insignificant and unworthy of notice, have ceased to exist, or never had an existence except on paper.

The number of acres indicates, nearly, the extent of operations. There are a few exceptions to this rule, some nurseries near large cities occupying but little land, but containing extensive ranges of green-houses, and doing a large business. A few others occupy much land with scattered specimens, and thus overstate their operations. The extent is in all cases intended to indicate the land actually under growing trees.

A good and well-managed nursery of hardy trees requires, on an average, one laborer for every two or three acres; the sales will average $250 per acre annually; and, on account of the necessary lapse of several years before cash returns are made, the nett profits should not be less than 40 per cent., (which is less on the capital invested than 5 per cent. for the tradesman who makes semi-annual sales.) By applying these numbers, the reader may readily determine very nearly the annual sales, cost, and profits of any good nursery, its extent being given. Thus, for example, a nursery of 100 acres managed in the best manner, requires from 30 to 50 hands, sells yearly $25,000 worth of trees, and clears $10,000 in money. There are a few that have occasionally exceeded these amounts; but many more have fallen below; while a great multitude, and especially those who enter the business with but little knowledge and experience, fail entirely.

There are some nurserymen who understand the business very superficially, and some are entirely unworthy of confidence. To point out such, and to name those also who are strictly reliable, and perfect masters of their occupation, would render the list more valuable, but it would be impossible in the present state of information.

[The dates give the time the nursery was commenced, and the post office address follows the name.]

MAINE.

John W. Adams, Portland, (2 miles from, at Westbrook R. R. Station)—1849—8 acres—a large dealer in native evergreens.
S. L. Goodale, Saco.
H. Little & Co., Bangor.

NEW-HAMPSHIRE.

Levi Burt, Walpole.
B. F. Cutter, Pelham, 4 miles from Lowell —4 acres, mostly forest and shade trees.
Joseph Pinneo, Hanover.

VERMONT.

R. T. Robinson, Ferrisburgh.

MASSACHUSETTS.

Anthony & McAfee, New-Bedford.
Barnes & Washburn, Harrison Square, Dorchester.
B. K. Bliss, Springfield—chiefly green-house and ornamentals.
A. Bowdich, Roxbury.
Breck & Son, Brighton.
James Brewer, Springfield.
D. C. Brewer, Springfield—30 acres.
E. W. Bull, Concord.
W. C. Capron & Son, Uxbridge—4 acres—an old establishment.
Asa Clement, Lowell (3½ miles from)—1848—10 acres.
S. H. Colton, Worcester—1839—12 acres, fruit and ornamental.
H. H. Crapo, New-Bedford.
Francis Dana, Roxbury.
L. Eddy, Taunton.
Evers & Co., Boston.
Isaac Fay, Cambridge.
Ebenezer Gray, Bridgewater.
O. B. Hadwen, Worcester—2 acres—buys most of his trees.
John A. Hall, Raynham.
Hovey & Co., Boston—nurseries at Cambridge—extensive and widely celebrated—large and fine ranges of green and hot-houses—and very extensive orchards of specimen trees, especially of the pear.
S. & G. Hyde, Newton.
J. F. C. Hyde, Newton Center.
John A. Kenrick, Newton—old and extensive.
D. W. Lincoln, Worcester—4 acres—buys most of his trees.
Robert Manning, Salem, "Pomological Garden"—established in 1823 by the elder Robert Manning, who soon made the best collection of specimen trees then in America—8 acres, and 3 acres specimen trees closely planted—widely known for its accuracy and the pomological skill of its proprietor.
Cheever Newhall, Dorchester.
Dexter Snow, Chicopee—a very extensive and successful cultivator of the Verbena.
J. C. Stone, Shrewsbury—6 acres.
W. C. Strong, Nonantum Hill, Brighton, 5 miles from Boston—50 acres closely planted with a general assortment of fruit and ornamental trees, and green-house plants. Special attention is given to the new grapes.
Henry Vandine, Cambridgeport.
Samuel Walker, Roxbury—1834—17 acres—pears predominate, which are raised with great success—one of the most reliable nurseries in the Union.
B. M. Watson, Plymouth.
Marshall P. Wilder, Dorchester—celebrated for its collection of pears, the specimen orchards of which are probably unequalled in America.
Geo. W. Wilson, Malden.

RHODE-ISLAND.

C. & D. P. Dyer & Co., Providence.
Silas Moore, Providence—1841—18 acres.

CONNECTICUT.

T. C. Austin, Suffield—1838—10 acres.
P. & H. A. Dyer, Brooklyn.
Stephen Hoyt & Sons, New-Canaan.
S. Lyman, Manchester.
J. Mason & Co., (formerly C. S. Mason & Co.,) Hartford—1853—3 acres, mostly small fruits, ornamentals, and green-house plants.
H. S. Ramsdell, West Thompson, Ct.—1836—5 acres.
Geo. Seymour & Co., South Norwalk—small fruits and New-Rochelle Blackberry.
Wm. H. Starr, East New-London—H. E. Chitty manager.
Paphro Steele & Son, Hartford (3 miles from.)
F. Trowbridge, New-Haven — does not raise trees, but an extensive and permanent dealer for 12 years.
Alfred Whiting, Hartford (3 miles from)—10 acres.
E. A. Whiting, Hartford (5 miles west from)—10 acres closely planted—commenced about 20 years ago with one acre, at which time the question was often asked, "Where will you find a market for all your trees?"—this, and two acres adjoining, being the largest in the State.
Henry Willis, West Meriden.

NEW-YORK.

S. H. Ainsworth, West Bloomfield, Ontario Co.—1848—26 acres — land thoroughly cultivated, costs about $3000 cash per year, and sales more than double this sum.
Silas Boardman, Brighton, 3 miles east of Rochester—1828—fruit trees generally.
J. W. Bailey, Plattsburgh.
J. Battey, (agent for owners,) Keeseville, Clinton Co.—12 acres.
C. P. Bissell & Salter, Rochester (nursery on E. Avenue)—1855 — mostly small fruits.
H. H. & J. H. Bostwick, Auburn—1848.
Anson Braman, Ithaca—1848—12 acres.
D. Brinckerhoff, Fishkill Landing, Dutchess Co.
Bronson & Merrill, Geneva — 1854 — 40 acres, mostly fruit trees.
Wm. Brocksbank, Hudson — 1836 — 15 acres.
Joseph Caldwell (manager for owner)—Troy, (on Mt. Ida, east of city,) 7 acres.
S. P. Carpenter, New-Rochelle—1850—mostly small fruits.
Henry Collins, Auburn (2 miles south of)—15 acres—one-half fruit trees, and the rest ornamentals, the latter mostly evergreens.
William Collins, Smyrna, Chenango Co.—small.

Fig. 127—*Ellwanger & Barry's principal Packing Shed, during the Selling Season.*

J. R. Comstock, Hart's Village, Dutchess Co.—7 acres—hardy fruits generally.
J. D. Conklin, Locke, Cayuga Co.—small.
John H. Corning, (formerly H. Snyder,) Kinderhook—P. O. address, Valatie, Columbia Co.—1838—25 acres—pear trees of successful growth a speciality.
Alvah Covey, Penfield, Monroe Co.—1845—30 acres.
Cowles & Warren, Syracuse.
John Dingwall, Albany—green-house and ornamentals.
J. Donnellan & Co., Hanford's Landing.
C. Dubois, Fishkill Landing.
Ellwanger & Barry, Rochester (1½ miles south of)—1838—440 acres—probably the most extensive nursery in the world. The wide celebrity of this great establishment, its extent of business, and the interest generally felt to know its operations, require a notice of corresponding fullness.

The Fruit Department occupies 350 acres, in about the following proportion of the different kinds :—Standard pears, 69 acres—Dwarf do., 51 acres—Standard

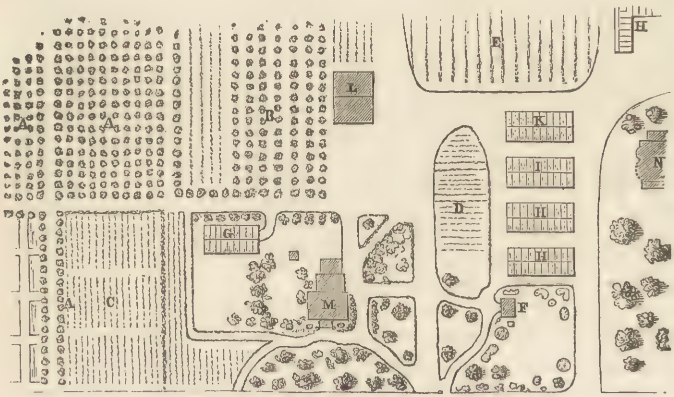


Fig. 128—*Home Grounds of Ellwanger & Barry's Nursery (about one-thirtieth part of their Home Nursery)—fronting Mt. Hope Avenue.*

A. part of Dwarf Pear specimen grounds—B. Part of Dwarf Cherry specimen Trees—C. Rare Evergreens, &c.—D. Herbaceous Perennials—E. Dahlias—F. Business Office—G. Cold Grapery—H H H. Green and Hot Houses—I. House for Propagating Grapes—K. Propagating House—L. Sheds and Working Cellars—M. Residence of G. Ellwanger—N. Residence of P. Barry.

Fig. 129—*Back View of Home Nursery of Ellwanger & Barry.*

Residence of P. Barry on the left—Business Office in the center—Packing-Houses, and Residence of G. Ellwanger on the right.

apples, 72 acres—Dwarf do., 31 acres—Standard and Dwarf cherries, 25 acres—Standard and Dwarf plums, 20 acres—and 82 acres of other fruit trees, seedling stocks, &c.

In the above-named department, the following items are more particularly worthy of notice. A fine 8-acre block of dwarf and standard cherries, containing 120,000 trees, two years from the bud; 12 acres of standard and dwarf pears in about equal quantities, two years from the bud, containing 130,000 trees of beautiful growth; another block of 20,000 plum trees from last spring's grafts, on 3 acres; 6 acres of currants, chiefly White Grape, Cherry, and Victoria, 200,000 plants; 4 acres of Houghton's Gooseberry, 70,000; 3 acres of New-Rochelle and Dorchester blackberries, 100,000 plants; and 100,000 hardy grapes on 3 acres.

The Ornamental Department occupies 90 acres, about as follows:—24 acres of evergreen trees, 50 acres hardy deciduous trees and shrubs, 8 acres roses, 3 acres dahlias, bulbs, and herbaceous plants, 5 acres specimen trees, &c.

The most remarkable items in this department are:—The evergreens, which exceed half a million in number, besides this year's seedlings; the 8 acres of roses; the weeping trees, covering alone over 2 acres; the Magnolias, of which there are more than an acre in one plot; the 5000 trees of the great Sequoia, or giant tree of California; and the great number of cuttings of roses and other shrubs in cold frames, exceeding 100,000, more than half of which were well-rooted by mid-summer.

The Glass Structures for plants and propagation cover 15,500 square feet.

The Packing-Houses and Sheds, consist of one packing-house 75 by 80 feet, two stories high, with cellars beneath—a shed 150 by 24 feet—and numerous temporary sheds erected at the commencement and removed at the end of each selling season. Besides these, there are several large stables—work-rooms for both departments—and sheds for sash-frames when out of use, pots, &c.

The *men employed* are about 225 to 250 in the season, and about 80 through winter. Three men are constantly employed in book-keeping, correspondence, &c., in addition to the extensive labors in correspondence performed by the proprietors themselves. They have opened and built a street, which is exclusively occupied by their foremen, head workmen, &c.

There are 25 horses employed for cultivating the nursery, &c.

A *single season's budding* numbers

Fig. 130—*New Street opened by Ellwanger & Barry in front of their Home Nursery and occupied wholly with Dwellings for Foremen and principal Workmen.*

about 700,000 in the fruit department, and 100,000 in the ornamental. To insure complete accuracy, one of the proprietors cuts all the buds, which he immediately passes to a number of hands who accompany him, who remove the leaves, when they are marked and transferred to the foremen of the respective budding companies.

Farnum & Halsted, Lockport (2 ms. west of)—begun 1841 at L. Ontario, removed 1855—25 acres.

B. Fish & Son, Rochester, (1½ ms. w. of city)—1854—30 acres.

Henry Fellows & Son, Penfield, Monroe Co. (7 ms. e. of Rochester)—1843—40 acs.

William Ferris, Throgg's Neck, Westchester Co.—30 or 40 acres, largely of evergreens and other ornamentals.

Freeman & Kendall, Ravenswood, L. I.—small fruits only.

growing nursery trees, the remaining 60 being required for the rotation, and now in preparation for future planting. Chiefly fruit trees, small fruits, and seedling stocks. There are extensive specimen grounds of trees, 2 to 10 years old. For the past 5 years, they have annually planted 12 acres of apples with about 140,000 root grafts; 3½ acres with 40,000 quince stocks for dwarf pears; 1½ acres with 20,000 pear stocks for standard pears; 1½ with 15,000 Mazzard cherry stocks; half an acre with 5,000 Mahalebs; 2 acres with 25,000 peach stocks; one acre with 10,000 plum stocks; and half an acre with 5,000 transplanted grapes, besides 2 acres of cuttings of the grape, currant, and quince, 3 of seedling stocks, 2 of ornamentals, evergreens, &c., and 3 of strawberries and raspberries for bearing.

Fig. 131—*Nurseries of A. Frost & Co., Rochester—Entrance and Green-Houses.*

A. Frost & Co., Rochester, (south of and near the city)—1848—200 acres—one of the largest and most complete nurseries in the Union, with extensive ranges of green and hot houses, and a rich assortment of fruit trees and ornamentals. The proprietors are eminently successful in raising evergreens from seed, of which they have an extensive supply, and in the propagation of new blackberries, raspberries, and other small fruits.

E. C. Frost, Havana, Schuyler Co.—1842—a general assortment of fruit and ornamental trees.

Graves & Warner, Syracuse.

T. E. Hayward, Pittsford, Monroe Co.—11 acres.

D. Higgins, Flushing, L. Island—40 acres.

S. H. Higley, Port Byron—3 acres.

P. Hildreth & Co., Watkins, Schuyler Co.—35 acres, fruit and ornamental.

T. Hogg, Jr., Bloomingdale, (near New-York,) Westchester Co.

H. E. Hooker & Co., Rochester—home nursery on E. Avenue—commenced 1830 by a former proprietor. Whole number of acres devoted to nursery, 152, of which 90 are actually under

With the exception of during the selling season, only about 20 men are employed, care being taken to accomplish as much labor as possible with horses.

Hooker, Farley & Co., Rochester, have an extensive wholesale nursery of over a hundred acres.

S. P. Hough, Albany—2 miles n. of city.

W. M. Hoyt, Brighton (near Rochester)—mostly apple.

Isaac Jacobs, King's Ferry, Cayuga Co.

S. T. Kelsey & Co., Great Valley, N. Y

William King, Rochester—mostly ornamental, roses, &c.

Silas B. Kelly, Brighton—30 acres.

Geo. D. Kimber, Flushing, L. I.—10 acres—new and thrifty.

King & Ripley, Flushing, L. I.—established in 1798 by James Bloodgood, and covered 12 acres up to 1829—now occupies 70 acres—hardy trees.

A. Loomis, Batavia—removed from Byron in 1857—8 acres—a large share of small fruits.

Manley & Mason, Buffalo—extensive.

McCarthy & Carter, Penfield, Monroe Co.

Matthew Mackie, Clyde—1840—12 acres.

James Mattison, Jacksonville, Tompkins Co.—25 acres—nursery and greenhouse.

T. C. Maxwell & Brothers, Geneva—(¾ m. west of)—1848—140 acres—chiefly fruit trees and stocks for nurserymen, with a portion of ornamental trees—land a strong loam, all tile-drained at a cost of $25 to $30 per acre. It is confined exclusively to hardy trees, and is conducted with much energy and success.

Maxwell, Bristol & Co., Dansville (late Maxwell, Ramsden & Co.)—1853—50 acres—fruit trees, excelling in pear and plum.

Lewis Menand, Albany—2 miles north of the city—green-house and ornamentals.

Moody & Son, Wright's Corner, Niag. Co.

Isaac Moore, Brighton, near Rochester.

Samuel Moulson, Rochester (N.E. of city)—hardy trees, extensive.

Nelson & Barker, Brighton, near Rochester—1853—24 acres, all fruit trees.

propagation is conducted with great success, and roses on their own roots, and rare coniferous plants and trees, are specialities.

Penfield & Burrell, Lockport.

W. R. Prince & Co., Flushing, L. I.—an old and celebrated establishment, commenced about a hundred years ago, and long famed for the fine varieties of fruit which it extensively disseminated during the early history of American Pomology, and while in the hands of its early proprietors—60 or 70 acres.

C. Reagles & Son, Schenectady—1830—50 acres—fruit trees generally; the plum thriving finely, is largely cultivated, and 400,000 are stated to be in different stages of growth.

C. J. Ryan & Co., Rochester—north of city—fruit and ornamental.

Fig. 132—*Entrance to A. Saul & Co.'s Nursery, and Residence of A. Saul.*

Outwater & Cuddeback, Wilson, Niag. Co.

Parsons & Co., Flushing, Long Island—1848—upwards of 100 acres, a first-class establishment. There are ten greenhouses, most of them 100 feet long, having 14,000 sq. feet of glass, besides the frames and pits, of which there are several thousand feet—and having probably the most extensive ranges of glass structures among American Nurseries. This nursery is particularly rich in ornamental trees and shrubs. The cultivation of trees and plants of difficult

A. Saul & Co., (successors to A. J. Downing) Newburgh—first commenced about 1816—in the hands of the present proprietors since 1847—40 acres, a general assortment of fruit trees and ornamentals—has very extensive specimen orchards in bearing, and among them about 500 varieties of the pear.

J. Sloan, manager for owner, Albany—2 miles south of city.

W. T. & E. Smith, Geneva, (¾ m. west of)—over 100 acres, with a green-house; fruit and ornamentals generally—the

whole conducted with much industry and energy.

Stone & Cook,(Stone about withdrawing,) Hinmanville, Oswego Co.—R. R. Station, Lamson's—20 acres, mostly apple.

speciality—and extensive and successful orchards of dwarf pears.

NEW-JERSEY.

Edwin Allen, New-Brunswick—1845—12 acres.

Fig. 133—*Nursery of Thomas & Herendeen, Macedon—Entrance and Business Office—Distant View of Nursery, &c.*

Thomas & Herendeen, (formerly J. J. Thomas,) Macedon, Wayne Co.—1838—hardy fruit and ornamental trees—a nursery of standard pears containing about 150,000, and other trees, lately planted at Union Springs, N. Y., where standard pears flourish with great success—whole nursery at Macedon and Union Springs, about 50 acres, closely planted with growing trees.

Thorp, Smith & Hanchett, Syracuse—established by A. Thorp in 1830, by planting nearly 5 acres to nursery—whole land now devoted to the business, 250 acres. Of this extent, fruit trees greatly predominate, and among these the apple and pear—20 acres are devoted to the smaller fruits ; 15 to evergreens ; 5 to ornamental trees ; 8 or 10 to shrubs and roses and ornamental plants. There is an extensive green-house,a propagating-house, and a rose-house. This is the largest nursery in central New-York.

W. P. Townsend, Lockport—excellent specimen orchards connected with the nursery.

W. Webb, Buffalo—green-house, &c.

R. White & Co., Newark, Wayne Co.—Thorp, Smith & Hanchett of Syracuse, joint proprietors ; R. White, resident manager—50 acres, all fruit trees.

Williams & Chapman, Manlius,Onon. Co.

John Wilson, Albany—green-house and ornamentals mainly.

T. B. Yale & Co., Brighton, near Rochester—about 80 acres, nearly all apple.

T. G. Yeomans, Walworth, Wayne Co.—1842—about 75 acres—dwarf pears a

David J. Griscom, Woodbury—largely of evergreens.

A. Hance & Son, Red Bank, Monmouth Co.

L. J. Harvey, Newark—1835—17 acres.

Wm. Parry, Cinnaminson—mostly small fruits.

Isaac Pullen, Hightstown—1825—42 acres, nearly one-half of which are dwarf and standard pears.

Samuel Reeve, Salem—14 acres—commenced by the father of the present proprietor soon after the Revolution.

William Reid, Elizabethtown—35 acres—remarkable as a neatly kept, accurate, and successful nursery.

George C. Thorburn, Newark.

PENNSYLVANIA.

Bockstoce & Sumner, Pittsburgh.

William P. Brinton, Christiana, Lancaster Co.—5 or 6 acres, new and thrifty.

Robert Buist, Philadelphia—a celebrated establishment, with extensive ranges of glass—roses a speciality.

Alan W. Corson, Plymouth Meeting P. O., Montgomery Co.—1845—7 acres—a miscellaneous nursery, with more than usual botanical accuracy.

J. L. Darlington & Co., (late Paschall Morris & Co.,)—West Chester—1845—about 100 acres—a general assortment, mostly fruit,of which the larger portion is apples.

Wm. P. Fisher, Unionville, Center Co.—1843—several acres.

Josiah Hoopes, (Cherry Hill Nursery,) West Chester—1854—20 acres—equal portions of fruit and ornamental trees

and shrubs—greatest, peach trees—a green-house, 3-acre arboretum, and fine specimen orchard.

Thomas M. Harvey, Jennersville, Chester Co.—1840—20 acres in nursery, and 10 acres in specimen fruit trees—one-half fruit trees, half ornamentals, largely of evergreens—green-house plants, &c.

Peter Keiffer, Andora—4 acres.

Peter Kuser, Boyertown—3 acres.

Samuel W. Lukens, Willow Grove—3 acs.

Lyte & Hough, Enterprise, Lancaster Co. —new.

Thomas Meehan, Germantown.

David Miller, Jr., near Carlisle—1842—25 acres, with ten more of specimen g'nds.

Samuel Miller, Lebanon, (2 miles from) Lebanon Co.—1850—6 acres—good specimen grounds.

Henry A. Mish, Harrisburgh—1856—6 acs.

John Murdoch, Jr., Pittsburgh (2, and 3½ miles from,)—1843—about 20 acres and 2 green-houses.

James M. Price, Oakdale, Delaware Co. —mostly small fruits—new—10 acres.

R. Waring, Tyrone, Blair Co.—1850—4 acs.

Wm. G. Waring, Boalsburg, Centre Co. —1857—6 acres.

MARYLAND.

John Feast, Baltimore.

W. Feast, Baltimore.

DISTRICT OF COLUMBIA.

Joshua Peirce, (Linnæan Hill,) near Washington.

John Saul, Washington—seed warehouse 390 Seventh-st.; nursery on Seventh-st. road—1853—80 acres, mostly new—a general miscellaneous collection—large importations made from Europe.

VIRGINIA.

Geo. D. Curtis, Moundsville, (½ m. east of, 12 miles below Wheeling)—10 acres.

Franklin Davis, Staunton—new.

Chalkley Gillingham, Woodlawn, near Mt. Vernon.

Miller, Ploak & Co., Lynchb'g, 1855—12 acs.

Yardley Taylor & Son, Purcelville, Loudon Co.—1833—mostly apple and peach —ornamentals and green-house plants—10 acres.

NORTH CAROLINA.

Moses Evans, Abbott's Creek, Davidson Co.—1845—20 acres, and an extensive experimental orchard.

Westbrook & Mendenhall, Greensboro'—1853—50 acres—a general collection of fruit trees and ornamentals, apple and peach predominating—a large green-house, and extensive experimental orchards—much has been done to test southern apples.

GEORGIA.

F. A. Mange, Augusta—nursery consists chiefly of roses on their own roots.

Peters, Harden & Co., Atlanta.

P. J. Berckmans & Co., Augusta—30 acs.

J. Van Buren, Clarksville.

MISSISSIPPI.

Thomas Affleck, Washington.

W. A. Whitfield, Shelby, Bay St. Louis, on the Bay of St. Louis—1853—23 acres, mostly peach and pear.

KENTUCKY.

Peter H. Barker, Greenville—1856—20 acs.

Carey, Peters & Carey, Louisville (7 ms. east of,)—1856—22 acres.

Geo. S. Curtis & Co., Maysville—1856—30 acres, and green-house—new.

M. J. S. Downer, Elkton.

Hobbs, Walker & Co., Williamson, Jeffer. Co. (12 ms. east of Louisville by R.R.,) —1853—40 acres—a general assortment, fruit trees, evergreens, &c.

Jacob Johnson, Cedar Creek, Jefferson Co.—1850—8 acres.

OHIO.

M. B. Bateham & Co., (Proprietors, M. B. Bateham and Ellwanger & Barry,) Columbus—commenced spring of 1855—20 acres planted that year, and 20 each succeeding year, now 80 acres—mostly fruit trees, but ornamental department extensive, and importations of evergreens made yearly from Europe—a hot-house and conservatory, and extensive specimen grounds—a first-class western nursery.

E. Bonsall, Jr., Salem—1846—20 acres, fruit and ornamental, and green-house —5 acres of evergreens.

Wm. Case, Cleveland—1848—conducted wholly by C. Weiges, foreman.

Clarke & Stalter, Lancaster—1846—25 acs.

J. S. Cook, (Walnut Hills,) Cincinnati—1846—20 acres, and green-house.

Edmond Craig, Cheviot, Hamilton Co. (5 ms. n. w. of Cincinnati)—1848—30 acres in compact nursery—hardy fruits and ornamentals.

Wm. Curtis, Brighton, Cuyahoga Co.—1851—6 acres.

George Dana & Son, Belpre—1817—10 acs.

James Edgerton, Barnesville, Belmont Co. —1850—15 acres.

A. Fahnestock & Sons, Toledo—about 70 acres, a part new; and a part the Old Toledo Nursery—a general miscellaneous collection.

J. Gallup, Cleveland—an old nursery.

J. L. Galloway, Milford, Clermont Co.—1855—8 acres.

H. N. Gillett, Quaker Bottom.

Joseph Harris, St. Clairsville, Belmont Co.—6 acres.

Wm. Heaver, Cincinnati.

James Houghton, Cleveland—5 acres, a part of Morse & Houghton's former nursery.

S. S. Jackson, Cincinnati.

M. Kelly & Co., Cincinnati.

W. B. Lipsey, Cardington (2½ ms. e. of,) Morrow Co.

A. McIntosh, Cleveland—1854, and before —8 acres, chiefly ornamental.

S. B. Marshall, Massillon—1846—8 acres.
T. W. Morse, (a part of former Morse & Houghton's,)—5 acres.
L. Nicholson, East Rockport, Cuyahoga Co. (4 ms. west of Cleveland)—1850—25 acres.
A. Robinet & Sons, Bedford, Cuyahoga Co.—1844—12 acres, and good specimen trees in bearing.
John Sayers, Cincinnati.
Dr. Edward Taylor, Cleveland—1856—35 acres—a general collection of fruit trees —a vigorous young establishment.
Toledo Nursery Association, Toledo.
J. T. Warder, (formerly Warder & Gilmore,) Springfield (1½ m. e. of,)—25 acs.
I. W. Weld, Richfield, Summit Co.—1846 —quite small.
Williams & Lewis, Dayton—1855—15 acs.
Samuel Wood & Son, Smithfield, Jefferson Co.—1816—15 acres, and extensive grounds of specimen trees in bearing.

MICHIGAN.

Wm. Adair, Detroit (east side of,)—1842 —25 acres, 12 of which is in trees, the rest in vegetables for rotation—the pear a speciality.
D. Cook, Jackson.
Hubbard & Davis, Detroit (2 ms. w. of,)—1846—20 acres, 16 under trees—a green-house and propagating-house—a general and miscellaneous collection.
Inglefit & Bentley, Monroe.
Wm. L. Randall, Adrian—1856—7 acres.
B. W. Steere, Adrian—1851—10 acres of select sorts and a good specimen orchard.
Tomlinson & Brother, Battle Creek (½ m. e. of R.R. Station,)—1854—20 acres.

INDIANA.

Geo. H. Andrews, Laporte.
John J. Conley, Richmond.
Jonathan Coggshall,Jonesboro',Grant Co.
W. T. S. Cornett, Versailles.
I. N. Davis, Connersville, Fayette Co.
Peter Fulhart, Muncie, small and new.
Hill, Goldsmith & Co., Indianapolis.
Gardner Mendenhall, Richmond.
Griffith Mendenhall, Richmond.
Thomas B. Morris, Cambridge City—7 acres.
Railsback & Hutton, Richmond—25 acres.
J. C. Teas, Raysville, Henry Co.—1843—25 acres, hardy fruits and ornamentals.
E. Y. Teas, Richmond—1857—6 acres.

ILLINOIS.

Verry Aldrich, Tiskilwa, Bureau Co. (3 miles from Bureau Station)—1852—10 acres, and bearing specimen trees.
I. C. Allen, Lena, Stephenson Co.—20 acs.
H. N. Bliss, Buda, Bureau Co.—1852.
Arthur Bryant, Princeton, Bureau Co.—extensive nurseries and orchards.
John B. Burbach, Princeton, Bureau Co. —6 acres.
Jabez Capps & Son, Mt Pulaski, Logan Co.
A. S. Coe, Port Byron, Rock Island Co.
Colman & Drake, Bloomington—10 acres, all apple.
E. B. Colman, Peoria—somewhat extensive, and green-house and orchards.
John A. Cook, Pavillion—1850—10 acres.
Dent & Verner, Wenona, Marshall Co.—1853—11 acres apple, 30 acres Osage hedge plants.
Robert Douglass, Waukegan, Lake Co.—1847—28 acres.
Michael Doyle, Springfield—(2 ms. w. of,) —chiefly fruits, some ornamentals, green-house & pits.
M. L. Dunlap, Leyden, Cook Co.
Samuel Edwards, Lamoille, Bureau Co. 30 acres nursery, and 12 strawberries—a well known establishment.
Lewis Ellsworth & Co., Napierville, Dupage Co.—1849—75 acres—40 acres apple —fruit and ornamentals, green-house and propagating-house. A branch of the same, 15 acres, at Wheaton, same county.
Emmert & Wheeler, Freeport—new establishment.
Isaac B. Essex, Drury, Rock Island Co.—1847—7 acres, and good bearing specimen orchard.
O. B. Galusha, Lisbon, Kendall Co.
John Garner, Nova, Jo Daviess Co.—8 or 10 acres.
Havens & Austin, Cass—1855.
William T. Henning, Palo—6 acres.
R. Herring, Durand, Winnebago Co.
C. H. Hibbard, Marengo, McHenry Co.
N. & C. G. Hotchkiss, Belvidere, Boone Co.—1850—14 acres.
J. Huggins, Woodburn, Macoupin Co.—1854—10 acres.
J. A. Kennicott & Sons, West Northfield, Cook Co.—fruit and ornamental—extensive and well known.
D. F. Kinney, Rock Island—1853—8 acs.
I. S. Knowlton, Byron, Ogle Co.—1847—12 acres.
J. T. Little, Dixon—1850.
Tyler McWhorter, Millersburg, Mercer Co.—extensive specimen orchard.
Manly & Lowe, Marshall, Clark Co.—1857 —10 acres.
Dr. I. D. Maxon, Henry, Marshall Co.—(formerly W. Mann.)
Otis Marble, Thompson's, Lake Co.
S. G. Minkler, Kendall—1852—11 acres.
Luman Montague, West Point, Stephenson Co.—small.
J. Moore, Dimond's Lake, Lake Co.
E. Ordway, Freeport.
Overman & Mann, Bloomington—fruits and Osage orange—the largest Osage plant and seed dealers perhaps in the Union—have raised in some seasons twelve or fifteen millions of plants, and had 1000 bushels of the seed—an energetic and intelligent firm.
Thomas Payne, Fremont Center, Lake

Co.—extensive grounds of specimen trees.
L. S. Pennington, Sterling, Whiteside Co. —1842—30 acres, and large collection of specimen trees.
F. K. Phœnix, Bloomington—1852, and for many years before at Delavan, Wis.—50 acres—extensive specimen orchards.
Rogers, Woodward & Glass, Marengo, McHenry Co.—1853—12 acres.
A. Ross, Ottawa—1856.
Edgar Sanders, near Chicago—1857—ornamentals, &c.
D. C. Scofield, (of the firm of Stephen Hoyt & Co., New-Canaan, Ct.,) Elyra, Ill.—40 acres.
Henry Shaw, Tremont, Tazewell Co.—1849—20 acres.
J. S. Sherman, Rockford—1854—20 acres.
E. H. Skinner, Marengo, McHenry Co.—21 acres.
H. Strickland, Roscoe, Winnebago Co.——1851—10 acres.
Stuart & Sons, Quincy and Payson, Adams Co.—extensive Pomological grounds.
John R. Tull & Son, Pontoosac (2½ miles from,) Hancock Co.—1847—15 acres, and many bearing specimen trees.
S. J. Wallace, Carthage, Hancock Co.—1857.
C. C. Wamsley, Palo—1851—12 acres.
A. R. Whitney, Franklin Grove, Lee Co. —50 acres or more—one of the largest and best western nurseries, with extensive bearing orchards.
Willard Brothers, Kewanee, Henry Co., 30 acres—green-house and hedge plants.

MISSOURI.

Husman & Manwaring, Hermann.
John Sigerson & Brother, St. Louis (a few ms. s. of city)—1843—200 acres devoted to nursery, besides 36 acres in strawberries, and 30,000 bearing fruit trees—green-houses, &c. One of the largest nurseries in the West.

WISCONSIN.

J. C. Brayton, Aztalan, Jefferson Co.
Colby & Willey, (formerly Charles Colby) Janesville—1848—20 acres.
E. B. & J. F. Drake, Janesville.
F. Drake & Co., Racine.
N. C. Gaston, Delavan, Walworth Co. (begun in 1843 by F. K. Phœnix,) 10 acs.
Charles Gifford, Milwaukee.
A. G. Hanford, Waukesha.
J. C. Plumb & Co., Lake Mills.
J. S. Sherman, Richmond, Walworth Co.
Levi Sterling & Co., Mineral Point—new.
Stickney & Loveland, Wauwatosa, Milwaukee Co.—1855—8 acres.
William Von Baumbanch, Milwaukee—10 acres.

IOWA.

Owen Albright & Co., Keokuk.
John W. Bennum & Co., Prairie Grove, Clark Co.
S. R. Boardman, Lyons—1854—20 acres, mostly apple.
Reuben Brackett, Lewis, Cass Co.
Gustavus B. Brackett, Denmark, Lee Co. —1842—12 acres.
A. W. Comstock, (formerly Avery & Comstock,) Burlington—40 acres—apple.
John Evans, Davenport, (5 ms. east of)—1846—3 acres, small fruits and ornamentals.
Finley & Dwire, Davenport, (a few miles west of)—extensive.
Foster & Negus, Muscatine—extensive.
Horr & Beebe, Dubuque—1848—20 acres, mostly apple.
Wm. Laer, Garden Grove, Decatur Co.—1854—4 acres.
David Leonard, Burlington—30 acres, nearly all apple.
Wm. Longworth, Dubuque—1848—20 acres, mostly apple.
Neally, Brothers & Bock, Burlington—1846—30 acres, nearly one-half ornamentals and small fruits—2 acres roses, 3 of evergreens—50 acres more of orchard and specimen trees. Nursery on Mississippi bluffs, and pear and apple grow to great perfection.
W. H. Plumb, Ft. Dodge—4 acres.
James Smith, Fort Des Moines.
Saunders & Co., Decatur City.
James Weed, Muscatine.
Wm. Zimmerman & Co., Oskaloosa.
[Apple trees are largely raised at Burlington, and probably a million trees are now offered there for sale.]

MINNESOTA.

[During the past eight years, about twenty nurseries have been commenced in different parts of Minnesota, but owing to the severity of the climate and other causes, most of them have been relinquished.]
L. M. Ford & Co., St. Paul (between St. Paul and St. Anthony)—1850—the most extensive on the Mississippi above Dubuque—mostly hardy fruits—the climate too severe for peaches, but grapes and all small fruits do well—40 acres are devoted to seeds and market gardening.
Robert Goodyear, Mankato—small—new.
A. Stewart, Le Seur—1856—10 acres.

KANSAS.

Geo. C. Brackett & Co., Lawrence.

NEBRASKA.

Joel Draper, Nebraska City—new.
James H. Masters, Nebraska City—1854—a general assortment of fruit trees and ornamentals—extensive.

CALIFORNIA.

[Nurseries generally in this State require *irrigation* for successful growth.]
G. G. Briggs, Brigg's Ranch, Maysville—1852—extensive, mostly peach. From the extensive market orchards connected with this nursery, there were sold $22,000 of fruit from 240 peach trees in

1857—67 peaches weighed 65 lbs., and sold for $48.75.

A. H. Myers, Alameda, Alameda Co.—1853—15 acres, fruit and ornamental.

L. Prevost, San Jose, Santa Clara Co.—1854—4 acres, fruit and ornamental.

Reed & Co., Sacramento City—1854—40 acres, fruit trees.

A. P. Smith, Sacramento City—1853.

Smith & Winchell, San Jose, Santa Clara Co.—1853—40 acres, mostly fruit, greater part apple.

Wm. Neely Thompson & Co., Napa, Napa Co.—1853—extensive.

CANADA.

Charles Arnold, Paris, C. W.—1852—5 acres, all fruit trees.

Thomas Burgess, London, C. W.—1854—10 acres.

Robert Cairns, Galt, C. W.—1851—10 acres, all fruit trees.

J. Caldwell & Brother, Waterloo, C. W.—1848—40 acres, chiefly fruit trees—1 green-house.

James Dougall, Windsor, op'site Detroit.

Dunning, Campbell & Co., Wellington Square, C. W.—20 acres.

Fairchild & Kelsey, Mohawk P. O., Grant Co., C. W.—1849—14 acres.

D. Fisher, Bowmansville, C. W.—1850—20 acres, fruit and ornamental.

James Flemming, Yonge-st., Toronto, nurseryman and seedsman—1842—extensive green-houses.

J. W. Gilmour, Peterboro', C. W.—1851—20 acres, fruit and ornamental, and 1 good green-house.

John Gray & Dr. Gwyne, Toronto—1850—10 acres—green-house.

James Greig, Pickering, C. W.—1848—15 acres.

E. Hubbard, Guelph, C. W.—1848—10 acres, all fruit trees.

E. Kelly & Co., Hamilton—1840—60 acres, chiefly fruit trees—a vigorous establishment.

George Leslie, Toronto, C. W.—1844—75 acres, three-fourths fruit trees, the rest ornamentals. There are two large green-houses—one of the most extensive nurseries, if not the most so, in Canada.

B. Losie, Cobourg, C. W.—1854—10 acres.

I. P. Lovekin, Newcastle, C. W.—1848—30 acres, mostly apples and cherries, and a share of ornamentals, chiefly evergreens.

D. Nichol & Co., Lyre, near Brockville, C. W.—1854—8 acres.

J. P. Thomas, Belleville, C. W.—1852—8 acres, fruit and ornamentals.

John S. Walker, Erie, C. W.

PRINCIPAL NURSERIES IN EUROPE.*

ENGLAND.

J. Backhouse & Son, York—extensive—largest and best nursery at that city.

G. Baker, Windlesham, near Bagshot, Surrey—American plants a speciality.

Bass & Brown, Sudbury, Suffolk.

Chandler & Sons, Wandworth Road, Surrey—extensive ranges of glass—collection of camellias unsurpassed in England.

J. & J. Cranstone, King's Acre, Herefordshire—extensive in roses.

G. Cunningham & Son, Liverpool—a large general nursery.

J. Cuthill, Camberwell, Surrey—small fruits and superior vegetables, &c.

F. & J. Dickson & Sons, Manchester—forest trees, evergreens, &c.

Donald & Son, Woking, Surrey.

Fisher, Holmes & Co., Sheffield and Handsworth, Yorkshire.

Garraway, Myers & Co., Bristol—a celebrated and extensive establishment, in the green-house and out-door departments.

R. Glendinning, Turnham Green, near London—rare green-house plants.

J. Griffin, Bath—the largest nursery near this city.

H. Groom, Clapham Rise, Surrey—bulbs.

J. A. Henderson & Co., Edgware Road, Middlesex—new and rare plants—a neat and extensive establishment.

E. G. Henderson, St. John's Wood, Middlesex—new plants, doing a large *wholesale* business.

W. Holland, Brompton, Middlesex—extensive in fruit trees.

G. Jackman, Woking, Surrey—American plants, &c.

W. Jackson & Co., Bedale, Yorkshire.

Jackson & Son, Kingston, Surrey—green-house plants, &c.

H. Lane & Son, Great Beekhamstead, Herts—extensive in roses.

J. & C. Lee, Hammersmith, near London—an old and celebrated plant nursery of great extent and richness.

H. Low & Co., Clapton, Middlesex—very extensive in glass and green-house plants.

Lucombe, Pince & Co., Exeter, Devon—a large general nursery.

W. Maule & Sons, Bristol.

* J. Saul of Washington City, and Ellwanger & Barry of Rochester, have furnished important materials for this list.

Osborn & Sons, Fulham, Middlesex—rare and fine trees, &c.
A. Paul & Son, Cheshunt, Herts.—famed for its roses, hollyhocks, conifers, &c.
T. Rivers, Sawbridgeworth, Herts—70 acres—the most extensive cultivator of fruit trees in England—a vast collection of roses, &c.
Rollinson & Son, Tooting, Surrey—vast ranges of glass, with orchids, heaths, &c., in great perfection.
J. Salter, Hammersmith, Middlesex—fl'st.
W. Skirving, Liverpool—a great nursery, with vast collections of evergreens.
G. Standish, Bagshot, Surrey—celebrated for rhododendrons, &c.
C. Turner, Slough, Bucks—a general establishment, and the most extensive in England in florist collections, as dahlias, hollyhocks, pansies, carnations, tulips, &c.
J. Veitch & Son, Exeter, Devon, } the
J. Veitch, Jr., Chelsea, Middlesex, } greatest collections of new and rare plants in Europe.
J. Waterer, Bagshot, Surrey—American plants and a general nursery.
Waterer & Godfrey, Knaphill, Woking, Surrey—general and extensive—peat plants a speciality.
J. Weeks & Co., Chelsea, Middlesex—rather new.
Youell & Co., Great Yarmouth, Norfolk.

SCOTLAND.

Cunningham, Frazer & Co., Edinburgh.
Dickson & Co., "
J. Dickson & Sons, "
Downie & Laird, "
P. Lawson & Son, "
Stewart & Sons, Dundee.
W. Urquhart & Sons, "

FRANCE, BELGIUM, HOLLAND, ETC.

Andre Le Roy, Angers, France—a general and very extensive nursery.
D. Dauvesse, Orleans, France—a general nursery.
Jamin & Durand, Paris—fruits.
E. Verdier & Son, Paris—roses, pæonies, &c.
Thibout & Keteter, Paris—plants.
L. Van Houtte, Ghent, Belgium—plants.
Ad. Papeleu, Wetteren, Belgium—hardy trees.
A. Verschaffelt, Ghent, Belgium—plants.
J. De Jonghe, Brussels, Belgium—fruit trees.
J. Linden, Brussels, Belgium—rare plants, a great collection.
A. Mielliez, Lille—new sorts of chrysanthemums and other flowers from seeds.
Ernst & Von Spreckelson, (successors to J. Booth & Co.,) Hamburg, Germany.
Krelage & Son, Harlaem, Holland—bulbs.
De Lange & Sons, " " "
F. Van Volson, Jr., " " "
E. C. Van Eden & Co., " " "

DEXTER SNOW ON THE VERBENA.

[The following excellent practical remarks on the treatment of this beautiful plant, were furnished by Dexter Snow, the most eminent and skillful cultivator of the Verbena in this country, and who carries on an extensive business in its propagation and sale.]

There is probably no flower that will afford more real pleasure or satisfaction for the outlay of money and labor, than this little gem. The brilliancy and great variety of its colors, the long-continued season of bloom, and its adaptedness to our hot summer sun, renders it the most valuable of all bedding plants. Many varieties are also admirable for vase or pot culture, and when properly managed as a house plant, will bloom profusely from January to May.

To grow them successfully, whether in-doors or out, they must be fully exposed to the sun, as they will not thrive without it. When grown as a house plant, they should be placed near the glass where the sun may reach them the greater part of the day. Give them a good airing each mild sunny day, by partially raising the window for an hour or so. This is quite indispensable to the health and stocky growth of the plant. The temperature of the room in the vicinity of the plants should average

Fig. 134—Verbena.

about 60° in the day-time and 45° at night. High night temperature causes the plants to spindle up and grow weak and sickly.

Water the plants only when actually necessary, or when the soil appears dry, and then do it thoroughly, taking care to pour off what falls into the saucer. Shower the foliage occasionally, to keep it clean and free from dust. In all cases use rain water for house plants.

Fumigate with tobacco as often as the *Aphis* or green-fly appears. This may be done by placing a dish of coals under the plant stands, and throwing on a handful of tobacco; or to avoid having the smoke in the sitting-room, set the plants in a group upon the kitchen floor; place a few chairs about them, over which throw an old quilt or carpet—let it reach the floor, so as to retain the smoke; place the coals and tobacco underneath, but not so near the plants as to scorch them. Ten or fifteen minutes smoking will destroy all the insects.

As a fertilizer for the Verbena, the sulphate of ammonia is excellent, giving to the foliage a dark-green, luxuriant and healthy appearance. It is economical, clean and easily applied. Prepare it the evening before

using, by dissolving one ounce of the ammonia in two gallons of water. It may be applied once a week with safety. A good fertilizer may be made by dissolving one pound of guano in ten gallons of water, letting it stand twenty-four hours before using. Apply it once a week.

For garden culture, the ground should be prepared in the fall by throwing it into ridges, and spreading over it a quantity of old and well decomposed manure. In thus exposing the whole to the action of frost, the worms and larvæ of insects are in a measure destroyed, and the soil becomes pulverized, and receives a share of ammonia from the snows and rains of winter. In preparing the beds or mounds in the spring, care must be taken not to get them too high, or the plants will suffer from drought. The ground should be spaded deep and the manure well worked in. Let the plants when put out be young, strong and healthy. Get them out as early in the season as the weather will permit, so that they may get a good start before the hot weather comes on—they will then keep out of the way of the root-louse.

In very dry weather the plants should be thoroughly watered every evening, and occasionally with guano. Keep the soil well worked about the plants, to prevent its becoming baked.

For a select list the following are very desirable, being strong growers, free bloomers, and showing large trusses of flowers that will stand the sun. Those with stars prefixed are very fine for vase or pot culture:

* Geant des Battailles—Deep scarlet crimson.
* Charles Dickens—Rosy Purple.
* Imperatrice Elizabeth—Striped ; should be in every collection.
* Mrs. H. Williams—Pure white.
Metropolitan—Bluish purple, fragrant.
Purple Perfection—Maroon purple.
Defiance—Intense scarlet.
* Madam Abelt—Deep purple maroon.
* Mrs. Archer Clive—Ruby crimson.
* Etoile de Venus—Rosy pink, very large.
Lord of the Isles—Clear deep rose.
Gen. Simpson—Rose red, tinted with carmine.

MANAGEMENT OF POULTRY.

BY D. S. HEFFRON OF UTICA.

On introducing the subject of Poultry to the readers of "The Annual Register of Rural Affairs," it may not be out of place to say, in justification, that the breeding of domestic poultry is valuable as a source of profit, as a means of a cheap and healthful amusement, and as affording a fruitful field of instruction.

Poultry may be kept on a small scale, in village, city or country, by almost every family. It is only when the stock is large that it requires more skill to make it "pay." Yet in England, Ireland and France, there are large sections of country where the raising of poultry for the city

markets constitutes the principal employment of the poorer and middle classes of the inhabitants, and is the only means of support of many.

Most persons have some time in life, been interested in feeding, watering, and caring for some feathered "pets." But while cage birds are not accessible to all, and some of them require much care and make no moneyed returns, poultry-keeping offers a self-supporting and healthful recreation and enjoyment to all classes of society. Our clergymen, teachers, lawyers, editors, merchants, bankers, as well as those who toil in the machine shop, the factory, or the furnace, each and all daily need some such light, amusing, recreative and healthful employment. Mowbray says:—"There is yet another point of view from which to hail the increasing and extended taste for poultry-rearing, so recently sprung up, as being calculated to produce effects of the highest social importance. We mean the humanizing (we had nearly said civilizing,) influences it cannot fail to exercise upon the teeming masses of our industrious town populations."

Poultry, by their early maturity and reproduction, afford one of the best opportunities to study the transmission of hereditary forms, colors, diseases, instincts and peculiarities, the influence of climate, food, &c., &c.

One of the first considerations to such as are about to commence poultry-breeding, is to select a suitable site for a poultry yard and house; for we think that few families in city or country, are so situated that they can keep any considerable number of fowls profitably, if they have not a suitable yard where they can be restrained at pleasure from doing damage to the garden and field. A gravel or a sandy soil, with a porous substratum, is the best of all soils for such a purpose. If it has an inclination to the south or east, all the better. But a poultry-yard must be dry to secure the health of the fowls; so if the soil is clayey, or retains moisture from any other cause, it must be properly drained; and it would improve it much to raise it by carting on a liberal quantity of sand and gravel. The size must of course vary with the number of fowls to be kept, but the larger the yard the better; and it is especially desirable to have a grass plat at one end. The Spanish, Dorking and Shanghæ fowls will bear confinement in small yards remarkably well, if the yard is dry, and the birds are fed daily with some kind of green food, as cabbage leaves, lettuce, white clover, and other tender grasses. The Hamburgh family, Polish, and most Game fowls are impatient in restraint, and do much better wherever they can have a wide range.

Fig. 135 is a cut of a poultry-house, (first published in "The Cultivator,") which is a model for cheapness, is very neat in its appearance, and quite as convenient as many much more expensive houses.

The length of such a house may of course be made to vary according to the number of fowls to be kept. If a ventilating tube should be put into each end of this house, it would very comfortably accommodate fifty

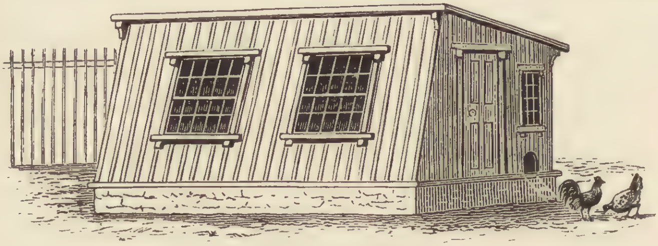


Fig. 135—Poultry-House.

fowls, twenty-five in each apartment; though if it were so heavily stocked, the droppings should be removed daily, as much as the horse-stable or the cow-stable should be cleansed daily.

We give the ground plan and section below, which exhibit the arrangement so clearly that any mechanic could easily build one like it.

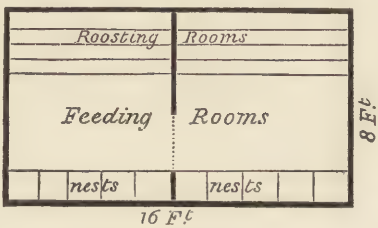


Fig. 136—Ground Plan.

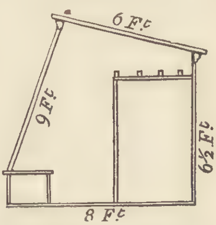


Fig. 137—Cross Section.

We should prefer to make the house one foot wider and a foot higher. This would give room enough to stud the house with three-inch studs, and to line it with one-inch matched boards. It should also be covered with narrow, sound, matched boards, and battened. Then fill up the space between the studs with dry tan, and nothing more is needed for warmth. Such a house would protect fowls with the largest combs from the influence of severe frosts, and beside, would furnish a large dividend on the additional expense, by daily installments of fresh eggs all winter.

The best material for the floor is a mixture of sand and gravel pounded down very firmly. The floor should be raised from 10 to 12 inches above the earth on the outside of the building, so as to guard against moisture. Bricks should never be used for paving the floor, as they absorb so much moisture from the earth that they keep constantly wet, and poultry cannot bear cold, wet feet much better than unfeathered bipeds can, without becoming rheumatic and gouty, and even roupy.

In winter every poultry-house should be furnished with a low box filled with dry wood ashes, and if mixed with a little dry sand, all the better.

In summer this "dusting bath" should be removed to the yard, and placed under an open lean-to shed, where it can be kept dry. Such a shed is easily made in one corner of the yard, by placing a few short boards over a frame, (made by driving four stakes into the ground, and nailing two cross strips to the tops about three or four feet from the ground.) This would also provide suitable shelter for the fowls in rainy weather.

In winter, another box, filled with old dry lime mortar, calcined bones, pounded oyster shells, and dry gravel, should be placed in the feeding apartment of the house.

Every house in winter, and yard in summer, should have fresh water once or twice daily.

By whitewashing the inside of the house two or more times each year, it may be kept free from all kinds of parasites.

Below we give a plan of a very convenient poultry-yard, divided so as to accommodate four varieties of fowls. The house, which should be built in the rear, would have to be 32 feet long by 8 or 9 feet wide; it should have four front windows, and should be divided into the same number of apartments by tight partitions made of matched boards. Each apartment should have a ventilating chimney. The references will explain it better than any description.

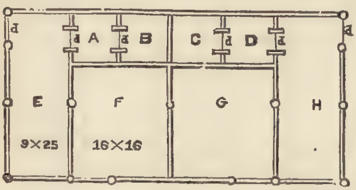


Fig. 138—Plan of Fowl House and Yard.

A B C D. Divisions of the poultry-house, 8 by 9 feet—E F G H. Yards. The yards should be tight-boarded, about two feet high, with slats above four feet, making the whole six feet high. The whole plan covers but 25 by 50 feet. It is better to have the yards larger, if the fowls are to be kept in them constantly.

If a large number of fowls of any variety is to be provided for, it is far better for the health of the birds, to build several small, separate houses than one large one.

Whenever a hen becomes broody, and it is proposed to give her a setting of eggs, it would be well to examine the top of her head and under her wings, and if any lice are found, either discard her, or rub on these places some kind of soft grease or oil. Then give her a fresh nest, and only a moderate number of eggs, so that they may be well covered at all times. She should be protected from the annoyance of laying fowls while sitting. When about to hatch, grease these parts again, and then leave her until all her brood of chickens are out. Remove the young brood and mother to a clean dry coop, free from vermin. If they come off early in the season while the ground is cold and damp, a part of the coop at least should have a board bottom, so that the hen

can carefully brood her young in a dry place. The hen should be fed, and supplied with fresh pure water at this time, as it is probable that she did not leave her nest for at least forty-eight hours before the chicks were all out. But the brood will need no feeding before they are twenty-four hours old; then feed some dry bread pounded fine. Soon a little pounded wheat, finely cracked corn, and hulled barley may be given to advantage. Some persons always feed young chickens with fine corn-meal, wetted up with water into a kind of dough. This food is strongly condemned by others; for if any of it is fed after standing until it begins to sour, it is known to be a positive injury. It is better not to feed it at all unless it is cooked; then mix it with a few boiled potatoes mashed finely, and it makes an excellent article of food. Curd of milk in limited quantities, is good food for young chickens. If too much trouble to prepare the curd, milk, either sweet or sour, may be freely given to fowls at any age with very beneficial results. Some breeders recommend that fresh meat be given in small quantities two or three times each week. We think it better to give the chickens when small the range of the garden, where they can catch their own meat and do good beside. Every one will of course see the propriety of feeding chickens frequently and regularly, unless the hen can scratch for them; beside, they must have fresh water in shallow pans to prevent accidents, or the water vessel if kept full, may be covered with a coarse wire screen.

Poultry Coop.—This coop (fig. 139) is made by nailing short pieces of matched boards together, as indicated in the accompanying cut; then board up the rear end tightly; nail narrow strips of boards or lath in front; put a floor of boards in the back part of the coop, large enough for the hen to brood her young upon, and lay a wide board in front to feed upon as long as the width of the coop, and we have as good a coop as can be made. The coop should be at least two feet high and from two to three feet deep. The board in front may be turned up at night to protect the young against rats, cats, &c., and should remain in the morning until the dew is off from the grass. The coop should be moved every two or three days to a clean place.


Fig. 139—Poultry Coop.

Poultry Feeding-Trough.—The feeding-trough here represented (fig. 140) is very cheap and convenient. It is made by nailing together two pieces of boards on one edge, in form of two sides of a triangle; one piece

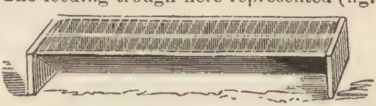


Fig. 140—Poultry Feeding-Trough.

should be six and the other seven inches wide, and then finish by nailing on the end pieces, which should be about eight inches wide and twelve long. To keep the fowls from getting into it with their feet, put a grate over the top, (made by nailing cross slats to two or three laths running lengthwise. The grating should be fastened so that the trough can be cleaned at pleasure.

FATTENING FOWLS.

If it is desired to fatten fowls in a very short time, they should be confined in small coops. Baily says:—" A coop for twelve fowls (Dorkings) should be thirty inches high, three feet long, and twenty-two inches deep; it should stand about two feet from the ground, the front made of bars about three inches apart, the bottom also made of bars about an inch and a-half apart to insure cleanliness, and made to run the length of the coop, so that the fowl constantly stands, when feeding or resting, in the the position of perching; the sides, back, and top may be made the same, or the back may be solid." Some writers think it better to make half of the floor a little inclined, and to cover it with a board. Troughs for feed and water should be fastened around the edge of the coop, and the whole placed in an out-building, as a barn or shed, away from other fowls. For the first twenty-four hours give water, but no food. On the second day commence feeding regularly three times daily with the most nutritious food, such as oatmeal mixed with milk, boiled wheat, &c., &c. The troughs should be cleansed daily, and a plenty of fresh clean water given; and the fowls must be fed very early in the morning, and all they will eat at all times. In from fourteen to twenty days they will be in their best condition, when they should be killed, for if kept longer they soon become diseased.

Poultry may be fattened quicker and more perfectly by stuffing, but it is an unnatural as well as an inhuman practice, and we cannot recommend it.

Dorking, Spanish, Game, Hamburgh, and Polish chickens hatched the last of May, in latitude 43°, will do well to fatten when three months old, but Shanghæ, Malay and Java chicks should be at least a month older.

WORK-SHOPS AND STORMY DAYS.

Every farmer who has boys should provide them a *work-shop*. It may be a building erected on purpose, or else partitioned off from the carriage-house, corn-house, or other out-building. Let it be neatly made, and not unpleasantly situated, for it should be attractive and not repulsive to those for whom it is is intended. It should be tight, and furnished with a small stove, so as to be comfortable in winter. It should be provided with a work-bench and vice, a shaving-horse for using the drawing-knife, and perhaps a small foot-lathe. The two latter are convenient but not essential. The tools should be two or three planes, augers of different sizes, a

few chisels, a brace-bit, drawing-knife, saw, and hammer. A small part of these will answer, and others may be added—the cost of the tools varying from five to twenty-five dollars.

Such a work-shop will afford several important advantages. The greatest is the assistance it will render the cause of *practical education.* The best inheritance any man can leave his children, is, not wealth to support them, but *the ability to help and take care of themselves.* A young man, whose natural ingenuity is so developed by practice that he can at any moment repair a rake, adjust a scythe, fit in a new hoe-handle, set a clock in running order, sow a broken harness, make a door-latch fasten easily, set a gate in good swinging condition, sharpen a pen-knife, give edge to a pair of scissors, mend an umbrella, repair a cistern-pump, whitewash a ceiling, paper a room, stop a leaky roof, make a bee-hive, bottom a chair, and black his own boots, will pass through the world more comfortably to himself, and profitably to those around him, and be far more worthy of the hand of the finest young woman in the country, than the idle and sluggish pretended gentleman, with pockets full of cash earned by his father, and who is obliged to send for a mechanic for all these things, which he is too helpless to perform himself. Dr. Franklin said, "if you want a good servant, serve yourself;" and, "if you wish your business done, *go;* if not, *send;*" and these sayings apply with especial appropriateness to such as have those jobs to perform, commonly known as "odds and ends."

Another important advantage afforded by such a work-shop is its *moral* influence in furnishing pleasant employment to boys during rainy or stormy weather or other leisure hours, and lessening the temptation to frequent taverns, and to attend places of diversion—often leading to the most pernicious habits.

Another, is the actual saving of expense to the farmer, in having around him ingenious boys, who will repair immediately any broken article, and save the cost of carrying it to the neighboring village, and the delay and inconveniences, often much greater, of waiting till it is mended. They will be able also to manufacture many of the simpler wooden implements required for farm use.

To keep every part of a farm and premises in the best and neatest order, cannot be accomplished unless the owner or his sons are of ready and active hands. Those who depend on hired men to perform the innumerable little services which this condition of a farm requires, will find that these services must be connected with an amount of constant observation and thought which cannot be secured by simply paying wages. It is therefore essential to educate the young managers to use their own hands, and become habituated to hand-work and thinking together; and the various operations connected with the work-shop will be found a most important auxiliary in accomplishing this very desirable result.

STREET TREES.

No words are needed to show the beauty and refreshing appearance of fine shade trees along the streets of towns and villages. But, to secure success in all instances, more care is needed to preserve them when newly planted. To prevent the rubbing of cattle (which by the way generally do ten-fold more mischief in streets than the value of their pasture,) some structure must be erected to shield them. After trying several modes, we find none equal to that shown in the annexed cut, (fig. 141,) neither in cheapness nor in neat appearance. It is well known to some of our readers, and consists, first, of two stout pieces of board, about five inches wide, and eight or nine feet long, which are inserted with the lower ends a foot and a half into the earth, and nearly upright or a little inclined towards the tree on each side. These are connected by four cross-boards nailed on horizontally, as shown in the figure; and the intermediate space has strips of common lath nailed on at intervals of three or four inches. These strips parallel with each other, but not quite horizontal; and being placed at opposite inclinations on the opposite sides of the structure, give a neat lattice-like appearance. The long upright pieces will be strong enough if of stout fence-boards; but would be more secure if inch-and-a-half plank. They are most easily set before the hole is filled; but may be inserted afterwards by partially hewing them sharp, and driving them into crowbar holes. If there is any danger from sheep, the lath may be nailed on the whole space, so as to enclose the tree from top to bottom.

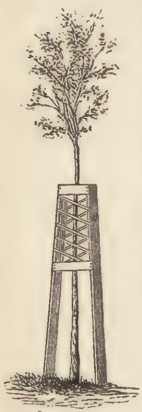


Fig. 141.

As street trees cannot be cultivated, they should be copiously mulched for the first few years, in a wide circle at least five or six feet in diameter. Sawdust or old tan answers a good purpose.

HILDRETH'S GANG PLOW.

Every implement which enables the cultivator to control more com-completely all his operations, becomes a positive benefit. There are some kinds of work which are better executed by the gang plow, than in any other way, and hence it is occasionally of great value to every farmer. Sod ground, which has been deeply plowed late in autumn, may be reduced to a very mellow surface by the use of the gang plow, leaving the sod undisturbed below. A thin coating of yard manure, or a thick dressing of compost, may in the same way be turned under and rendered

available for corn planted on the sod. Corn stubble, plowed in fall, may be seeded very early in spring by covering the seed with this implement. There is still another use, of value to small farmers. A seed drill, costing nearly a hundred dollars, is too expensive a machine for a five-acre wheat-field—the gang, costing only twenty-five dollars, forms a useful and convenient substitute. Hildreth's

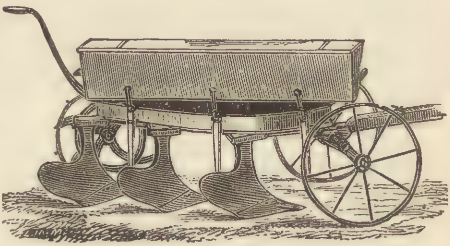


Fig. 142—Hildreth's Gang Plow.

gang plow, (made by Hildreth & Charles at Lockport,) which in our own use we have found exceedingly convenient, is furnished with a seed-box, as represented in the accompanying cut, which sows any desirable quantity of seed from a peck to three bushels per acre, and the plows cover it at one operation; and in this respect it possesses an important advantage over the wheat drill, which requires complete previous preparation. Hildreth's machine is made entirely of iron except the tongue; the depth of cutting and the width of slice may be regulated with complete accuracy; and two horses plow three furrows at a time with ease, the friction from the weight of the machine and of the earth, being obviated by the wheels which sustain the plows and on which they run. It is liable to clog in wet stubble, and always performs more perfectly in clean ground.

A CHEAP HORSE POWER.

The admirably constructed endless-chain powers of Emery, Wheeler, Pease, and others, have proved machines of great convenience to moderate farmers, who do not wish to be dependent on itinerant eight-horse power threshers, requiring several extra horses and extra hands. It is both independent and economical to be able to thresh grain within doors, in winter, or during stormy weather. The chief objection to the endless-chain power is its cost. We have lately examined

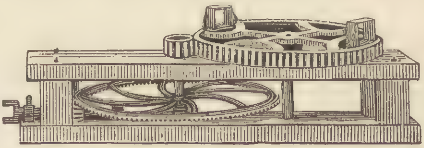


Fig. 143—Hildreth's Horse Power.

a horse-power manufactured by Hildreth & Charles of Lockport, N. Y., and furnished much cheaper, or at less than half the price of the endless-

chain powers. Fig. 143 gives a fair representation of this power, needing little further explanation. It is best secured to its place and kept solid by wedging into mortises in two logs, set in the earth, across which it is placed.

It is usually for two horses, but strong enough for four. In addition to threshing, it may be employed in sawing wood, pumping water, driving straw-cutters, cap-augers, slitting saws, for turning grindstones, or churning.

The "tumbling-rod" revolves about a hundred times in a minute—a suitable velocity for a cross-cut saw for cutting logs into stove-wood.

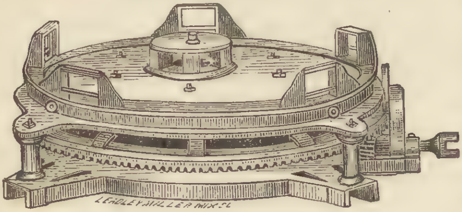


Fig. 144—Hildreth's Horse Power.

A larger, more durable horse-power, manufactured at the same establishment, is shown in fig. 144. It is wholly iron, very neat and compact, and so durable that some have been run for years without the expenditure of a dollar in repairs. The whole gearing is covered with a cap, so that the driver cannot be injured, and the wheels are protected from dust. It is adapted to eight or ten horses, and the cost is $110.

CUTTING GRAFTS.

There is no better time to cut grafts than at the commencement of winter. In cutting and packing them away, there are some precautions to be observed. In the first place, let them be amply and distinctly labeled, as it is very annoying to find the names gone at the moment of using them. For this purpose they should be tied up in bunches, not over two or three inches in diameter, with three bands around each bunch—at the ends and middle. The name may be written on a strip of pine board or shingle, half an inch wide, a tenth of an inch thick, and nearly as long as the scions. This, if tied up with the bunch, will keep the name secure. For convenience in quickly determining the name, there should be another strip of shingle, sharp at one end, and with the name distinctly written on the other, thrust into the bundle with the name projecting from it. If these bunches or bundles are now placed on ends in a box, with plenty of damp moss between them and over the top, they will keep in a cellar in good condition, and any sort may be selected and withdrawn without disturbing the rest, by reading the projecting label. We have never found sand, earth, sawdust, or any other packing substance, so convenient,

clean, and easily removed and replaced, as *moss*, for packing grafts. It is needful, however, to keep an occasional eye to them, to see that the proper degree of moisture is maintained—which should be just enough (and *not a particle more*,) to keep them from shrivelling. They must, of course, be secure from *mice*.

Plum grafts, which are sometimes injured by intense cold, are generally better if cut before the approach of the severest weather, and securely packed away.

Compost for Gardens.—*Principal ingredients*—Stable manure, more or less, and turf from fence corners; these laid in alternate layers, a few inches thick, and occasionally added as other materials increase. *Auxiliary ingredients*—Weeds, litter, rakings of leaves, potato tops, wood and coal ashes, soapsuds, dish-water, refuse hair, dust from house sweeping, chicken and fish bones, gutter scrapings, and nearly every thing else that would be " dirt " elsewhere. Rotted a year in a heap, and these ingredients will form a valuable compost, to the benefit and neatness of the premises.

Apples for Domestic Animals.—Sweet apples are of great value in feeding almost any kind of farm animals. Hogs fatten rapidly on them, as well as on those that are acid. Cows, fed moderately at the start, on well cracked or cut apples to prevent choking, will increase in milk and improve in condition. Apples form an excellent succulent food for horses in winter. Varieties should be specially sought for feeding animals, combining hardiness, thriftiness, and great bearing qualities. Among the best now known are Corlies' Sweet, Pumpkin Sweet, and Haskell Sweet for autumn—and Green Sweet for long keeping. At the west, the Hightop or Summer Sweet is the best early sort, and the Sweet Pearmain and Sweet Romanite for autumn and winter.

Productive Apple Trees.—For early, and great and continued bearing, the *Baldwin* will probably stand first—five or six-year trees often affording three or four bushels of fruit, and old trees sometimes yielding forty or fifty bushels. Next to the Baldwin, stands the *Jonathan*—a most excellent and very handsome apple, but rather small in size. The *Rhode Island Greening*, and *Tompkins County King*, are also great bearers, but do not give such early crops as the Baldwin or Jonathan.

Draining Orchards.—It is best to place underdrains *between* the rows of trees—because, first, the large roots sometimes run down and injure or derange the channel; and secondly, because it is the space between the rows that is covered by the great mass of small fibrous roots, which furnish the nutriment to them. As dwarf pears do not send roots so far nor so deep, they may be set directly over the drain if desired.

ILLUSTRATED ANNUAL REGISTER

OF

RURAL AFFAIRS.

ORNAMENTAL PLANTING.

COUNTRY homes are of two kinds—the repulsive and the beautiful. The former are occupied by those who know nothing of domestic enjoyment, and who seek happiness in the bar-room and grog-shop. They never see any charms in the works of nature—ornamental shrubbery to them is "brush," and flowers are only "weeds." They never plant a rose-bush nor a shade tree. They sometimes set out a few apple and cherry trees. But these are left to take care of themselves, and what remain after ten years, appear like those shown in figure 1, instead of attaining the perfection seen in figure 2, as

Fig. 1.

Fig. 2.

they would have done if well managed and properly cultivated. They have an especial contempt for all ornamental trees, and exclaim,

Fig. 3—*Premises of the Man "who Cares nothing for Looks" nor for the Comforts of Home.*

"What! set out trees that don't bear anything fit to eat—that are only good to look at!" Their dwellings are bleak and desolate. There is nothing about them attractive to their children, who grow up with no attachment to home, and with little appreciation of the social virtues. The first figure on this page, (fig. 3,) is a representation of all that is inviting in the homes of their childhood, and where from the earliest

Fig. 4—*Premises of the Man who makes Home attractive to his Children.*

dawn of their forming minds, they have received most of their impressions of life. Few of them have been able to surmount these discouraging influences, and they have become coarse and unintelligent. How different might have been their character if they had been brought up under the influences of the other home represented on the same page!

This neat cottage (fig. 4) cost no more in the first place than the

dilapidated one. Its owner kept it in perfect repair, and planted and cultivated the encircling grounds during those spare moments that his neighbor who lives in the other, occupied at the tavern. Each house cost nearly a thousand dollars in building; while the planting and cultivation of the grounds about the latter, did not require an expenditure of fifty dollars.

There is now scarcely an intelligent mind who does not admit for the above reasons, the real and substantial value and utility of ornamental planting. Added to its utility, is the fascinating employment of imitating the most beautiful natural groupings of objects, by planting and arranging trees. With all these inducements, great and increased attention should be given to the subject, and it would open a world of exalted enjoyment to those who pursue it. Most fortunately, it does not require necessarily a profuse expenditure of money. As much skill may be employed in decorating the limited grounds of a cottage, at an expense within fifty dollars, as in laying out and planting a magnificent park of hundreds of acres, costing many ten thousands.

Much money is wasted in attempts to ornament the grounds of a dwelling before a well digested plan has been adopted. Alterations alone have sometimes cost more than the execution of a complete well arranged design. We have known owners to expend more in excavating and in building terraces, with a real injury in appearance, than others would in effecting the most finished improvement. In one instance the owner of a suburban residence, with the constant labor of two gardeners, succeeded in accomplishing less in the way of neat and beautiful appearance, than another with the services of a single gardener but two days in each week. The art of ornamental planting cannot be learned in a single day, but like any other art, requires much thought and study, with all the assistance that may be derived from the experience of others. Those who wish to understand the subject completely are referred to Downing, Sargent, and Kemp, for full instructions; but a short article like this may perhaps afford many useful hints to those who cannot give so much time to the subject, or whose moderate grounds and limited means may not warrant great expenditure.

In offering suggestions on this subject, it will be best to begin at the beginning, and lay down briefly a few rules for selecting a site for a dwelling. The following requisites may be regarded as important nearly in the order in which they are named, but some will transpose them more or less, according to their preferences.

1. Healthfulness.
2. Neighborhood.
3. Soil and climate.
4. Suitable site, convenience of access, &c.
5. Scenery and views.

The first is all-important, as no home comforts can atone for ruined health. The second is scarcely inferior, for a family possessing civilization and refinement cannot properly enjoy themselves when constantly exposed to the petty annoyances of vulgar and pilfering neighbors, and who are shut out entirely from the social enjoyment of such as are of a congenial character. Where a whole neighborhood unites in works for public benefit and moral improvement, the very atmosphere seems purer and more delightful, than where semi-barbarism and selfishness are the ruling influences. A *fertile soil* is all-essential to the resident who would obtain the necessaries and comforts of life from his own land; and a climate favorable to the cultivation of the finer fruits is equally so to every one who expects to enjoy a constant circle of these most wholesome and delicious luxuries. The *site*, and suitable conveniences for access, are important considerations. A low, foggy place, will be unhealthful; a high one, without shelter, will be bleak and cold; if very near a public road, it will be exposed to noise, dust, and obtrusive observation; if remote from the road, much needless traveling will be required, and not a little inconvenience will be found in time of deep snows. A gentle eminence, and a moderate distance from the public road, and the shelter of evergreens on the side of prevailing winds, will obviate most of these difficulties. A quiet side-road branching from a main highway, will often be better than directly on a great thoroughfare. Comparative nearness to places of public worship, to schools, a post-office, mill and railroad station, are each of considerable importance, and should all be taken into consideration. The value of *fine scenery* will be variously estimated; some would prize it as all-essential, while others would scarcely think of it. Some would merely covet a showy situation as seen from the nearest highway, in order to draw the admiration of travelers; others, discarding such motives, would only desire beautiful views from the windows of the dwelling or from the surrounding grounds, in order to make their homes interesting and attractive to their children.

The site having been selected, the next step is to build the house. This portion of labor does not belong to our present subject, but the plan and intentions should be well understood before the exact spot for the house is fixed upon, and its frontings determined. This precaution is essential in order to secure the finest views, and to furnish protection from winds, or from undesirable odors or unsightly objects.

Great progress has been made within a few years in the art of ornamental planting, but it is still so common to witness defects, that to point out some of these defects in the first place, will more fitly prepare the way for specific directions.

The most common error of past years, but now rapidly disappearing, is the practice of planting only in straight lines or geometric figures. Absolute stiffness reigned supreme, in the attempt to avoid any approach

towards *irregularity.* A neighbor, intelligent in other things, when he saw the first specimen of the natural mode of planting, exclaimed, " Why, Mr. T.! you have none of your trees in rows!" He considered a want of straight lines a striking evidence of a bungler. The geometric style not only required this formal regularity, but *symmetry*, as it was termed, demanded that every object should have its corresponding one. A tree on one side must oppose just such a tree on the other side; a row on the right was to have its accompanying row on the left. It is stated that the old gardener of the Earl of Selkirk, was so strongly imbued with this mania for symmetry, that when he shut up the thief who stole his fruit in one summer-house, he was compelled for the sake of symmetry, to put his own son in the other opposite. How immeasurably more pleasing and beautiful than this stiff and artificial mode, is the simple imitation of the beautiful and picturesque in nature, which constitutes the modern or natural style of planting.

It is not an unfrequent error to suppose that the modern style consists *merely* in *irregularity*. But irregularity without arrangement, is not taste—confusion is not the beautiful in nature. The *perfection* of art consists in producing a pleasing effect, while the art which produced it is concealed from the eye of the spectator. The scenery which artificial planting produces, may *appear* to be the accidental arrangement of agreeable parts or objects; but it must really be the result of close study and a careful eye—in the same way that the roughly dashed work of a skillful painter, where every touch, rude and accidental as it may seem at first glance, is found on taking the whole together, to produce a most perfect and complete combination of different parts. And one great excellence of the modern style consists in its complete adaptation to all grades of residences—it does not require costly embellishments, nor a profuse outlay—the cottage resident may show as much skill in a *tasteful simplicity*, as the owner of the magnificent park in the disposition of his broad lawns and majestic forest trees.

In order to produce the best effect in grouping trees, these requisites are essential—*unity*, *harmony*, and *variety*. The following is an example

Fig. 5—*Example in Grouping.*

in illustration (fig. 5)—and the scene represented in fig. 6 on the following page, exhibiting a natural group of elms, possesses everything agreeable

Fig. 6—*Grouping Elms.*

but *variety*—and it possesses much of this quality so far as the arrangement of the trees is concerned, but it lacks variety from the trees being all of one kind. For this reason the preceding example (fig. 5) is free from objection.

The next figure (fig. 7) affords an illustration of monotonous irregularity; and presents the same appearance that some grounds do after they have grown up with trees which have been planted all over without regard to effect or to open portions of lawn, or distant views

Fig. 7—*Monotonous Grouping.*

towards beautiful objects. On the other hand, the two following figures present fine examples of natural grouping; the first (fig. 8) exhibiting the advantage which may be taken of slight undulations in the ground, in increasing the picturesque variety which it may afford; and the second (fig. 9) a fine and exceedingly varied sky outline produced by a group of dissimilar trees, yet all supporting each other and harmonizing together.

No error is more common with those who have "a *little* knowledge" on the subject of planting and designing grounds, than in attempting to combine within the limits of a small place, all the different objects that

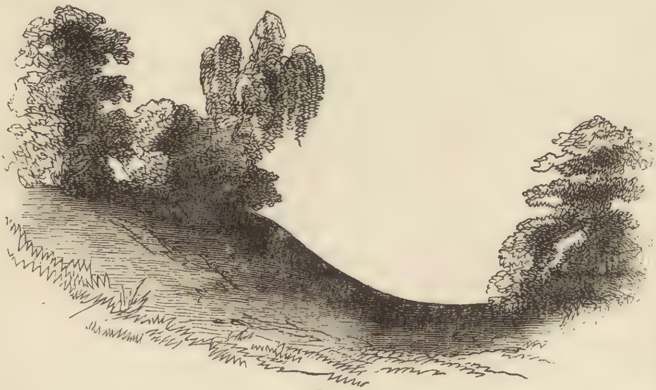


Fig 8.

can be introduced only in extensive grounds. Neat and harmonious simplicity is sacrificed to incongruous confusion. This propensity is

Fig. 9.

sarcastically exhibited by Lowell in his account of the "*Rural Cot of Mr. Knott*," a dwelling

> "'Twixt twelve feet square of garden plot,
> And twelve feet more of lawn,"

containing meadow and upland, a water view, (consisting of pump and trough,) and a woodland made up of

> "Three pines stuck up askew,
> Two dead ones and a live one."

The house was built cheaply of wood, and painted in imitation of stone; but so much was expended on odd conceits and flimsy ornaments, that

> "Ere many days poor Knott began
> Perforce accepting draughts that ran
> All ways—except up chimney;

The house, though painted stone to mock,
With nice white lines round every block,
Some trepidation stood in,
When tempests (with petrific shock,
So to speak,) made it really rock,
Though not a whit less wooden."

Among other errors often committed in the attempt to crowd many objects within a small space, is the construction of a multiplicity of walks, beyond what is useful or essential; planting trees over the whole surface, rendering the grounds uniformly spotted with them; introducing too many flower beds; making artificial mounds or terraces, instead of merely softening off the naturally varying surface; placing rustic objects in immediate connection with the house, the architecture of which does not at all harmonize with them; and especially to be avoided is the error of introducing *shams*, which will be discarded by every person of correct taste. Among these, as Kemp observes, are "artificial ruins, mere fronts to buildings, bridges that have no meaning, and for which there is no necessity," to which we may add all puny attempts at artificial rock work, which are only small heaps of stones.

Persons of more moderate pretensions, including a large portion of such as live on medium-sized farms, fall into another error. They devote to ornamental planting a square plot of ground exactly in front of the dwelling, and varying from half an acre down to two rods square. This is

Fig. 10—*Residence with a Neat Front Yard only.*

enclosed with a picket fence in the form of a *tight pen*, with one straight walk passing through the center from the front door down to a small gate opening into the public highway. Very few ever pass through this gate or enter through the front door; but carriages, wagons, and foot passengers go in at the large gate just without this square yard, and enter the house by a side or back door. The square yard is therefore often allowed to grow up with grass or weeds, and is shaded by a few cherry trees, one or two lilac bushes, and a few hollyhocks. Occasionally it is seen in much better order, with a straight and neatly-kept gravel walk lined with shrubs and flowers, and with rows of cherry and pear

trees on either side—(fig. 10.) This is, however, the only neat portion of the whole premises; for the worm-fence enclosures on the right and left, and the back yard, contain a numerous collection of cord-wood, old rails, empty boxes, barrels and barrel hoops, unburned brush, plows and sleds, wagons and carts, pails and kettles, chips, slop puddles, &c. It appears, however, like a neat and comfortable residence to the traveler who is careful to look at it only at the moment when he is exactly in front.

Plans of Grounds.

A small town or village residence, with only a few feet of ground, may be laid out as represented in the accompanying figures. Fig. 11 exhibits a front yard about twice the breadth of the house, and with about fifteen or twenty feet from the front door to the street. Instead of the straight narrow walk too often seen, this is broad, with curved sides, passing on the left to the garden, and on the right to the kitchen and barn. A small gate on the right admits entrance to the kitchen without passing up the front walk, and the curved passage from this side-gate being closely planted with evergreens, is rendered less conspicuous. Fig. 12 is a larger place, admitting greater variety in the form of the walks, and several arabesque flower beds cut in the smooth shaven lawn. The exterior is planted with the larger shrubbery or trees, evergreens standing nearest the boundary, and growing thickly where it is desired to conceal any unsightly neighboring building or other undesirable

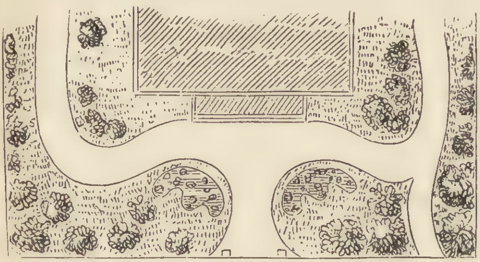
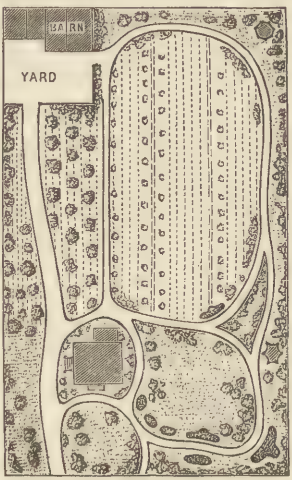


Fig. 11.

Fig. 12.

object, and leaving an opening where the view is of a pleasing character. In grounds of the limited extent of these two residences, perfect neatness should prevail; the soil should have been previously made deep and rich, that the trees and shrubs may grow freely with rich foliage; the part covered with grass should be smooth, (the grass seed having been sown very thickly, or at the rate of two or three bushels per acre,) and the grass mowed twice a week within half an inch of the surface, during the early part of the season, and once a week later; the gravel walk should be as smooth as a floor, slightly convex or curved upwards, and trimmed with a true curve at the edges.

Fig. 13 exhibits a plan for the grounds of a village residence, varying from half an acre to an acre, and where a horse and cow are kept. The front portion, as far back as the dwelling, is occupied with lawn, kept closely shaven, with trees and shrubs, and a few flower-beds bordering the walks. In the rear and on the left is a small orchard, through which the carraige road passes; and in the yard which it enters is the horse and carriage barn, the cow-house, and poultry-house. On the right is the fruit and kitchen garden. This is laid out so as to admit of plowing at least once a year, as well as horse-cultivation so far as may be desired. The rows of fruit trees are dwarfs, with currants and gooseberries and the other smaller fruits. The boundary of the kitchen garden is planted with roses and flowering shrubs, through which a neatly kept walk passes, thus giving the advantages of a wider extent of ornamental grounds. Converting the kitchen garden into a lawn, and providing a kitchen garden by extending the grounds to the left, would form a more perfect place.



13—*Grounds of a Village Residence.*

A design for the grounds of a farm residence, where half an acre to an acre is devoted to ornamental planting, is exhibited in fig. 14. The carriage road enters nearly in front of the house, bending slightly, and forming a sweep for turning—from this the carriage may return to the road, or pass to the carriage-house in front of the barn-yard. On the left is a pear and cherry orchard planted in the quincunx manner; in front and to the right is the lawn, kept smoothly shaven and planted with trees and shrubs. These grounds are traversed by a curved walk five

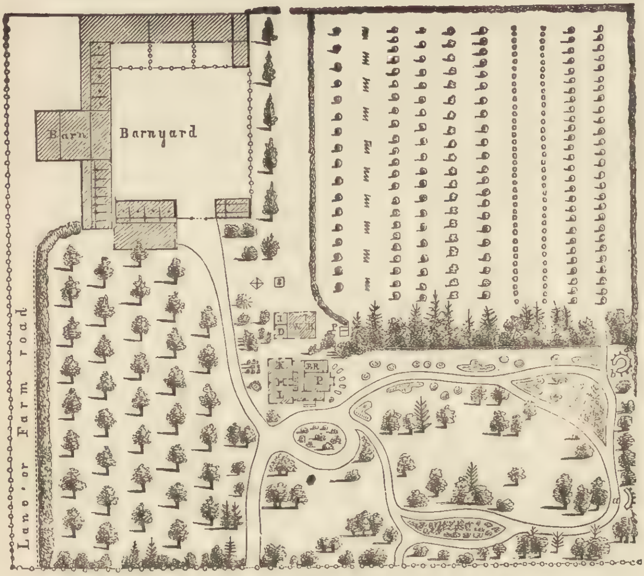


Fig. 14.

and a-half feet wide, which is bordered with several flower-beds. The boundaries are most thickly planted where the view is undesirable beyond; and the view across the lawn is left nearly unobstructed towards the most distant points, and especially towards the seat *a*, and the summer-house *b*. In the rear of the grounds is the garden, which combines the kitchen and fruit garden for dwarf trees. They are planted in rows, and consist of dwarf pears, dwarf apples on doucain stock, gooseberries, currants and raspberries, and dwarf plums. Between these rows the ground is cultivated by horses, the garden vegetables being planted in drills to admit the passage of a narrow cultivator.

There is perhaps an imperfection in this plan. To constitute it a finished specimen of landscape gardening, the ornamental portion of the ground should lie more in the rear from the public road. A residence with ornamental grounds only towards the highway, has a shallow and ambitious appearance—indicating more desire to be admired by strangers, than to secure domestic comfort, privacy, and rural beauty. This defect, however, is not very prominent in the present plan.

Fig. 15 is the plan of about three acres occupied as a garden and ornamental grounds, belonging to a gentleman residing near Liverpool, England, and given in Kemp's Landscape Gardening. The public road

Fig. 15.

runs nearly east and west, on the north side of the dwelling; the finest views are only towards the south-east and south-west, in which direction the surface of the land descends. The house is therefore made to front those views, and not as many would absurdly make it, towards the road, which is an object possessing no interest whatever as a component part

of a beautiful natural scene. To the right of the house (1) the view is entirely obstructed by trees, which shelter from the westerly winds, and which also partly conceal the carriage-house and stables, (4) leaving a small entrance from the circular sweep to the carriage yard (3.) The carriage-sweep passes round a large ash tree. The conservatory (6) lies towards the kitchen garden (9.) The portion of the grounds nearest the dwelling, (shaded in the design,) is planted with trees, and kept as a smoothly shaven lawn; it is separated from the white or unshaded part by a wire fence at the curved dotted line, the latter being used for a sheep or other pasture. The wire fence being invisible at a short distance, the whole appears from the windows as one continuous lawn. At 10 is a fountain at a low place in the grounds, surrounded by a few regular flower-beds and beds of dwarf evergreens. These might be omitted in a place of less costly and finished character. The boundary, it will be perceived, is mostly concealed by trees, a boundary fence seen at any point being an undesirable object. The walk which extends around the pasture, and passes through the kitchen garden, is perhaps nearer this boundary in some places than true taste would admit; but it will be observed this is not only intended for purposes of utility as a pasture, but as an arable field when desired. Hence too broad a strip of land should not be taken for the passage around it.

It will be seen that this plan possesses one very important advantage over that given in fig. 14, in the broad view which it furnishes by connecting the lawn with the pasture; while the ornamental grounds in fig. 14 are narrow and limited, and obstructed by its thickly planted exterior.

Where the selection can be made, the most desirable site for a residence is where the public road passes on the north side, from which there is a slight ascent towards the house, and afterwards a considerable descent in an opposite direction and towards the finest views. This gives a more secluded character to the place, furnishes a more unobstructed and rural view across the grounds, and affords a warmer aspect for the garden and plantation.

Planting and keeping such a home as this need not be expensive. The portion immediately contiguous to the dwelling, may be neatly kept sheared once a week with the scythe. A wire fence may separate this part from the more extensive pasture beyond, which may be made to assume the character of a park by being planted with ornamental and shade trees. The view (fig. 16) at the head of the next page, represents a farm residence of the better class, surrounded with about an acre of neatly kept lawn, beyond which there are twenty or thirty acres interspersed with fine spreading trees of the chestnut, oak, black walnut, maple and ash, and which affords valuable pasturage for sheep, which keep the grass trimmed short. The reader is requested to contrast the

Fig. 16.

trees here seen, with the appearance the same would present if planted in stiff geometric rows.

The plan (fig. 17) on the following page, also copied from Kemp,* exhibits a place where a small lake is embraced within this wire-fence boundary. This lake, which covers an acre and a-half, was made in a curious manner. Its place was occupied by a number of old marl-pits filled with clear water. These were bordered with old oaks of stunted growth, and picturesque masses of thorn, furze, and other brushwood. Many would have looked upon this as a most unsuitable place for the front of a fine mansion. With a little excavation, the pits were thrown into one for the lake; the islands being formed out of unremoved portions of the division banks. A little dressing converted the wild growth of the trees and shrubs into appropriate clothing for the islands and banks. The islands with their covering, served to diversify and conceal the boundaries of the lake, and impart magnitude, as trees alone perform the same office in an enclosed lawn by hiding the exterior. The house was built on a bank above the level of the water, towards which the lawn gradually sloped, and the lake formed a characteristic foreground to the somewhat level country beyond, terminated by blue hills fifteen miles distant.

Various Details.

Lawns.—The dry summers of this country preclude the greenness and freshness of the perfect lawns of England; but by deepening and enriching the soil to cause a free growth of the grass throughout the season, a great improvement may be made. In providing a lawn, therefore, the

* We are indebted to the liberality of John Wiley, for cuts of several of the plans in Kemp's admirable Treatise on Landscape Gardening, and to A. O. Moore & Co. for several figures of trees from Downing's Landscape Gardening and Loudon's Arboretum.

Fig. 17.

first thing is to prepare the soil by trenching or subsoiling, with the addition of fine, pulverized manure, equally mixed throughout. It is of great importance that the manure should be very evenly applied, as dark and light spots occasioned by its irregular application, destroy the beauty of a piece of grass. The seed should be sown at the rate of at least two or three bushels per acre—otherwise a fine close velvet turf cannot be secured. White clover and red-top are an excellent mixture, and the grass continues green through the summer—and to this mixture a portion of the English lawn grasses may be added, if within reach at the seed stores. Never seed down a lawn in connection with a grain crop, but sow alone, early in spring, and roll the surface, which will cover the seed if the ground is previously fine and mellow. It is scarcely necessary to urge the importance of a perfectly even surface, free from knobs or furrows. This remark does not, however, apply to the easy and graceful undulation which may be given to the ground where nature has deviated from the perfect level. No lawn can be satisfactory unless kept constantly shaven. Some who have first allowed the grass to grow several inches high, are disappointed on mowing it, to find a brown and bare appearance of the new surface. The lower portions of the grass having been shaded by the growth above, lose their greenness. But if allowed never to reach more than an inch in height, the blades will be numerous, and green down to the very roots, and the whole will appear like a dense surface of fine moss, or like velvet.

Walks.—If the soil is light or gravelly, never retaining any water, a space may be dug out the width of the intended walk, and filled, first with coarse gravel, and afterwards with finer for the surface. But in most soils the walk will need additional preparation. If the surface ever retains water, the walk should be dug at least a foot deep and filled within a few inches of the surface with small or broken stone, which will form a solid and dry bottom to the gravel. Provision should be made for the free escape of any water which may settle among these stones, by suitable underdrains. A solid stone foundation is still more important for a carriage drive covered with gravel; but to prevent small stones working up, these should be put at the bottom, and larger stones, *point upwards*, be evenly laid, between which the gravel will become wedged in by the roll of the wheels, and form a hard mass, (fig. 18.)

Fig. 18.

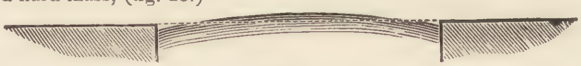


Fig. 19.

The above figure (fig. 19) represents a section of a gravel walk, being a little lower than the grass at the edges, and rising by a slight convexity

about two inches in the middle. In order that this convexity may be perfectly uniform, and the surface smooth, a gauge-board cut with a corresponding curvature, is used in finishing the walk. It must then be rolled hard with a cast-iron or stone roller.

It is essential to good appearance, that curved walks be entirely free from all appearance of angles or abruptness at any point. When the curve is made to increase or diminish, it should be done gracefully and uniformly. It is usually accomplished in practice by first drawing the plan on paper, and afterwards transferring it by measurement of its principal points to the ground. This is not difficult, if drawn accurately to a definite scale; short pegs being used to mark the points. Intermediate curves may be laid out with much accuracy, by sticking short pegs of wood into the ground at equal distances from each other, but instead of being in a straight line, let each one deviate a certain uniform distance from the right line, and a true curve will be formed. When it is desired to change from a short to a longer curve, gradually increase the distance between the pegs, (fig. 20.)


Fig. 20.

The following rules for designing curved walks should always be observed:

1. They should never follow closely a boundary fence, and where they pass near it, it should be hid by the foliage of trees, of which that of evergreens is most dense.

2. They should never bend without an obvious reason—either to avoid a change of level, a group of trees, a mass of shrubbery, a flower-bed, or to reach a distant object not lying directly before the spectator. Unmeaning curves, or zig-zag undulations, should be especially avoided.

3. Where short curves occur, the walk should be hidden except immediately before the spectator; otherwise the increased distance may appear tiresome.

4. Walks running nearly parallel should be entirely hidden from each other.

5. They should have some definite object to reach, as a summer-house, arbor, or interesting point of view. "A walk that leads nowhere," says a late writer, "or ends in nothing, is always unsatisfactory."

6. Planting should be dense along such parts of the walk as require the concealment of unsightly objects, and open whenever fine prospects may be brought into view.

7. A rise or fall in the surface of the ground where suitable, may be made to add much to the variety of the scenery; but a sudden rise or depression should be carefully avoided.

8. If walks separate, the branch should pass off at an outward curve, and they should take, as Repton observes, a decided turn from each other,

so as not to seem as if they would soon unite again. This rule is not applicable to a mere temporary diversion, as around a cirular bed or mass of shrubbery.

The Baldness of New Places.—The remorseless manner in which the native trees have been totally cleared away from country residences, has left most of them in a very bleak and unsheltered situation. A neighbor had a fine natural oak grove before his house, but being strongly imbued with the cut-and-slash mania, chopped them all down, and then planted a row of maples in their place, which would require about thirty years to attain the size of the oaks. Sir Joshua Reynolds said he would paint Folly in the shape of a boy climbing over a high fence with an open gate close at his side. He might have done it more effectually by representing an American land-owner cutting down all his native shade trees, that he might enjoy transplanted ones thirty years afterwards.

There are, however, many places where a thin natural growth of trees may be found, and among which a residence may be built. Yet with a most singular fatuity, such land-owners avoid these beautiful natural parks, and build in an open field adjacent. We witness frequent instances of this folly.

Where trees have grown up thinly, their heads have become rounded and well developed, and nothing is easier than to remove those possessing the least beauty, or which may stand in the range of fine landscape views. Even such as have grown closely together, and have shot up bare trunks, may be greatly improved in appearance in a few years, by heading them down soon after thinning out, as low as a good supply of side branches will admit, and gradually bringing them down into a fine form in successive years. The addition of other trees by planting, will soon greatly improve the appearance of the whole, and impart to the wildness and crudeness of nature, the grace and finish of an embellished landscape.

Where necessity leads to the selection of such places as have no trees, the most rapid mode of supplying the deficiency is, first to prepare the soil in the best manner by trenching or deep subsoiling, at the same time working in large quantities of old manure or compost. Then plant moderate-sized, thrifty trees, which have been carefully taken up, and keep the soil bare and mellow for a few years, foregoing the pleasure of a green turf for the sake of a more rapid growth of the trees. Large trees when set out present a more conspicuous appearance at first, and some may be interspersed, but in a short period the smaller ones will have outstripped them, and will then present a richer, more dense, and far more beautiful foliage. By selecting a portion of the most rapidly-growing sorts, as the Silver Maple, the European Larch, and the Abele, among deciduous trees; and the Norway Spruce, Scotch Pine and Austrian Pine, among evergreens, a more speedy effect will be secured.

Rockwork and Rustic Objects.—The grounds in immediate connection with the house should present a neat, graceful and finished appearance —unless the house itself partakes of the picturesque character of architecture, and be of small size and in the rural Gothic style. Rustic structures, rockwork, and climbing plants, and a tangled wildness of growth, should be at a distance, and be sparingly introduced unless there is a good deal of diversity in the surface of the ground, as a glen, a steep ascent, or a rocky bank. We have seen a rustic arbor, thatched with straw, most singularly out of place almost in front of a Grecian dwelling, and not unfrequently pillars and festoons of climbing and trailing plants in nearly the same relative position. The latter, with a few occasional rustic structures, may occupy a remote portion of any ground, even if quite level, provided the planting is less trim and finished and more free and wild, in that direction, so that the transition may be gradual from one to the other.

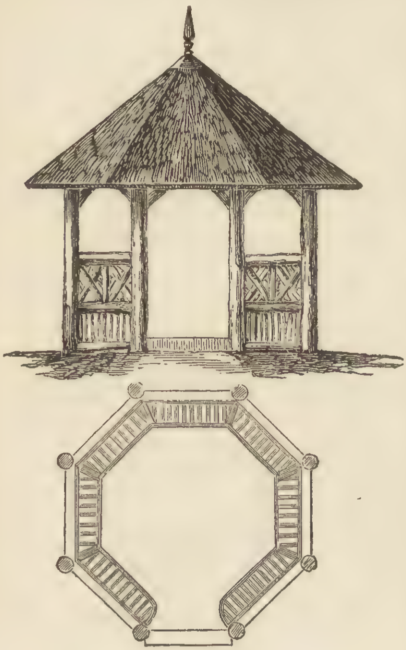


Fig. 21.

A neat rustic summer-house is shown in the annexed plan and elevation, (fig. 21,) copied from Kemp. It is made of unbarked larch, and thatched, the seat being plank. It is about eight feet in diameter. The posts may be set in the ground, the tops sawed off even, and the rustic frame attached. One quite similar to this, but with a board roof, is shown in fig. 10 of the Register for 1858. A less formal and more picturesque structure, is represented by fig. 22 on the following page; and another somewhat similar, but still more rustic in character, and embracing the trunk of a spreading tree, in fig. 23 on same page. Rustic seats, for placing under the shade of trees, are shown in figs. 24, 25, 26 and 27.

Plans of Gardens.—The geometric style for flower gardens, not only

requires a large expenditure of labor, for it must have constant dressing, shearing, and trimming—but it always tends to convey to the spectator an impression of a smaller extent of ground than really exists, with the still farther disadvantage that the eye sees and comprehends the whole at once, after which there is little or no variation in the expression as seen from every part. But a garden in the modern or graceful style, requires far less labor to keep it, for it may be mostly green turf, with occasional elliptical and arabesque flower-beds cut in this turf, and it affords a constantly varying scene from every point of the walk, and by

Fig. 22.

Fig. 23

Fig. 24.

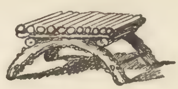


Fig. 25.

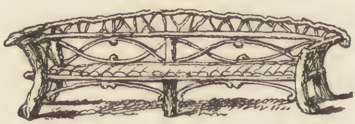


Fig. 26.

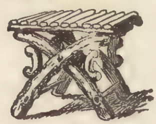


Fig. 27.

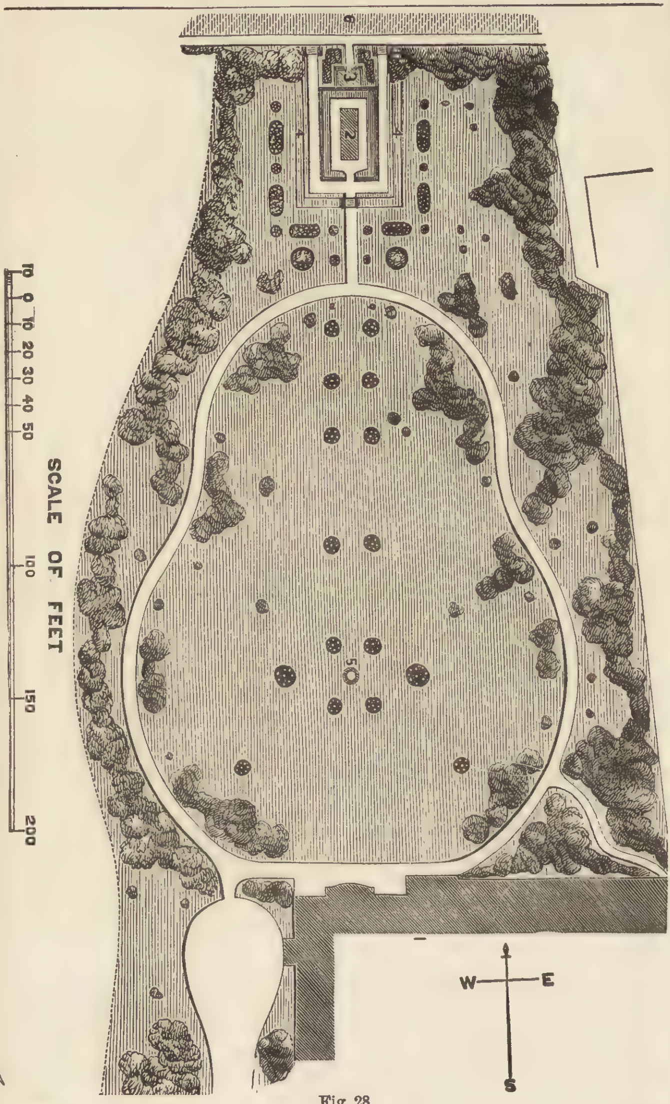


Fig. 28.

this perpetually changing scene greatly increases the apparent extent of the grounds.

The most easily managed garden is one where the beds are chiefly planted with hardy shrubs and with the larger and more vigorous growing herbaceous perennials. The mode of treating beds of this kind is pointed out on pages 201 and 299 of the first volume of Rural Affairs. A very neat and somewhat regular garden is represented on the preceding page, (fig. 28.) It is separated by a wire fence (shown by the dotted line,) from the larger portion of the lawn containing trees, and kept grazed by sheep. The outer portions of this garden are planted with small trees and large shrubs; the circular and oblong beds contain small flowering shrubs and herbaceous perennials, including the more brilliant bulbous species for early flowering, followed by transplanted annuals. In this design the house is at 1, green-house 2, fountain 5, kitchen garden 6.


Fig. 29.

Fig. 29 represents a picturesque garden planted wholly with trees and shrubs, having an uneven surface of ground. The parallel walks being concealed from each other, either by dense planting or by intervening ridges, the effect of great variety and extent is produced, although but half an acre is occupied. The summer-house, represented at the upper right corner, is on an eminence, and commands an extensive prospect.

Trees.

The limits of this short article forbid anything more than a faint allusion to the endless variety of expression which may be produced by a combination of different trees. If the whole landscape were willows, or if all were Lombardy poplars, and placed on a dead level, the prospect would be dull in the extreme. This subject has already been alluded to on a previous page; but the labors of the artist may be facilitated by observing the special character of each. The outlines of trees may be classed under several different heads. They are *round-headed* like the walnut, oak and chestnut, (fig. 34); *spiry-topped*, as in the larch and several species of spruce, (figs. 30, 31, 32); *oblong-headed* as in the Lombardy poplar; and *drooping*, as in the weeping willow, weeping ash, &c. All degrees of modification in these general divisions, furnish a great diversity of outline.

The following clear, practical and interesting directions from Downing,

cannot fail to be useful to every person planting his own grounds, and in effecting the endless combinations which may be produced in arranging and grouping the many forms which different species of trees afford:

"The only rules which we can suggest to govern the planter are these: First, if a certain leading expression is desired in a group of trees, together with as great a variety as possible, such species must be chosen as harmonize with each other in certain leading points. And, secondly, in occasionally intermingling trees of opposite characters, discordance may be prevented, and harmonious expression promoted, by interposing other trees of an intermediate character.

Fig. 30—European Larch.

"In the first case, suppose it is desired to form a group of trees, in which gracefulness must be the leading expression. The willow alone would have the effect; but in groups, willows alone produce sameness: in order, therefore, to give variety, we must choose other trees which, while they differ from the willow in some particulars, agree in others. The elm has much larger and darker foliage, while it has also a drooping spray; the weeping birch differs in its leaves, but agrees in the pensile flow of its branches; the common birch has few pendant boughs, but resembles in the airy lightness of its leaves; and the three-thorned acacia, though its branches are horizontal, has delicate foliage of nearly the same hue and floating lightness as the willow. Here we have a group of five trees, which is, in the whole, full of gracefulness and variety, while there is nothing in the composition inharmonious to the practiced eye.

"To illustrate the second case, let us suppose a long sweeping outline of maples, birches, and other light, mellow-colored trees, which the improver wishes to vary and break into groups, by spiry-topped evergreen trees. It is evident that if these trees were planted in such a manner as

to peer abruptly out of the light-colored foliage of the former trees, in dark or almost black masses of tapering verdure, the effect would be by no means so satisfactory and pleasing, as if there were a partial transition from the mellow, pale green of the maples, &c., to the darker hues of the oak, ash, or beech, and finally the sombre tint of the evergreens. Thus much for the coloring; and if, in addition to this, oblong-headed trees, or pyramidal trees, were also placed near and partly intermingled with the spiry-topped ones, the unity of the whole composition would be still more complete.*

Fig. 31—Balsam Fir.

"Contrasts, again, are often admissible in woody scenery, and we would not wish to lose many of our most superb trees, because they could not be introduced in particular portions of landscape. Contrasts in trees may be so violent as to be displeasing; as in the example of the groups of the three trees, the willow, poplar, and oak; or they may be such as to produce spirited and pleasing effects. This must be effected by planting the different divisions of trees, first, in small leading groups, and then by effecting a union between the groups of different character, by intermingling those of the nearest similarity into and near the groups; in this way, by easy transitions from the drooping to the round-headed, and from these to the tapering trees, the whole of the foliage and forms harmonize well."

Saving Expense.—A few of our countrymen expend yearly in preserving the finish and fine cultvation of their ornamental grounds, from

* We are persuaded that very few persons are aware of the beauty, varied and endless, that may be produced by arranging trees with regard to their coloring. It requires the eye and genius of a Claude or a Poussin, to develop all these hidden beauties of harmonious combination. Gilpin rightly says, in speaking of the dark Scotch fir, "with regard to color in general, I think I speak the language of painting, when I assert that the picturesque eye makes little distinction in this matter. It has no attachment to one color in preference to another, but considers the beauty of all coloring as resulting, not from the colors themselves, but almost entirely from their harmony with other colors in their neighborhoods. So that as the Scotch fir tree is combined or stationed, it forms a beautiful umbrage or a murky spot."

five to ten thousand dollars. The majority of country residents do not, however, expect to devote a hundredth part of this amount. It is worthy of attention to examine how cheaply the delights of ornamental planting may be obtained. Every owner of a place should determine well beforehand what he has to perform. He must carefully count the cost; for nothing can be much worse than to lay out an extensive flower-garden or a plantation of shade trees, and leave it unfinished, rough with neglect, and covered with weeds. A very little, in the best order, is better than ambitious shabbiness. Be especially careful, therefore, not to plan more than there is ample provision in labor to neatly execute.


Fig. 32—Norway Spruce.

An acre of ornamental planting may be kept by different owners after a different manner, each perfect in its way, but widely varying in the required expenditure. If occupied chiefly with flower-beds and gravel walks, and the succession of flowers is maintained throughout the season by re-planting from reserve grounds, several gardeners would be required. If the grounds are, however, kept mostly in turf, with some shade trees, and a few neat beds of shrubs and flowering plants properly interspersed, the

Fig. 33—Honey Locust.

labors of one man would fully answer the purpose.* Grounds of a still cheaper character might again be sufficiently attended to, if allowed to partake more of the wildness of the picturesque, presenting a more uneven surface, denser and more varied planting, giving little artificial symmetry to any of the trees, festooning them in some of the wilder parts with climbers, and allowing some underbrush to grow beneath them. The smaller portion of grass lying between them would grow less rapidly than when wholly exposed, and need less frequent

Fig. 34—Weeping Ash.

* An acquaintance residing at one of our smaller cities, succeeded in keeping one of the neatest half acres of garden we ever met with, (which was a perfect velvet of turf, with walks, and a few broad flower-beds,) with the labors of one gardener only, a day and a-half each week.

mowing. The gravel walks, however, which traverse these grounds, should be kept studiously neat, or the whole will have a neglected and decayed appearance. It would be a great error to suppose that such a piece of ground as this may be designed without careful study; nothing could afford a better opportunity for testing the combined abilities of a landscape painter's eye, and of the ornamental gardener's skill, in producing the pleasing diversity, the sky outline, the blending of light and shadow, and the changing combination of objects as seen from every advancing step of the spectator.

Most of the designs we have given of the grounds about dwellings, indicate a considerable amount of attention required for the beds of shrubs and flowers. An unobjectionable and much cheaper mode, adapted to farm residences where there is plenty of room, is to introduce shade trees only—such for example as the chestnut, oak, elm, black walnut, maples, and other natives of a similar character. Two or three acres or more of these, planted in park style, may be kept as a neat lawn by occupying them as sheep-pasture, at no expense whatever. This treatment is only adapted to such places as are already grown with these trees.

COUNTRY DWELLINGS.*

The enjoyment to be derived from living in the country, depends in great measure upon two things—a tasteful house and a pleasant garden. Fortunately with us, these conditions of enjoyment are within the reach of every healthy, industrious man. Neither imply the presence of wealth or elegance. They are the results simply of good taste, and a certain amount of cultivation, acquired either through books, society, or observation. The poor man, evidently, may possess taste and cultivation just as truly as the man of wealth. He is, perhaps, not quite so likely to possess them; still, for him the way is open no less than for others.

The necessity that the poor man be possessed of taste and cultivation, will seem all the more urgent when we consider that they become his most available capital, and especially so when dealing with the things of nature. They are to him as gold and lands. They supply the place of elegance and luxury, and are such treasures as, without which, even elegance and luxury are nothing but tinsel and a vulgar sham, if they be not clothed with taste and made to show the hand of cultivation in all their arrangements.

It has been with the purpose of bringing to the aid of those not likely to consult more expensive and elaborate works on rural architecture—or

* This article and its excellent original designs, were prepared expressly for this number of the Register by Geo. D. Rand of Hartford, Conn.

if they should consult them, should find everything on too costly a scale for their purposes—that we have introduced into these pages from year to year, such designs as, in our judgment, are calculated to improve the taste and furnish some available knowledge upon the subject of building a home in the country. We have some reason to believe that our previous efforts have been widely appreciated; and we hope this further contribution may be as favorably received and as extensively useful.

We have thought it of little use to publish designs of cottages containing, besides the pantry, closets, &c., less than three rooms. No good American housewife is for any long time content with less, and no industrious, intelligent working-man, need ask his wife to take up with less. Those who are willing to live in more straightened quarters, would never look into these or any other pages for a design for such a cottage, but would build something after the style of those they were familiar with, whether it were the log cabin or the Irish laborer's shanty of turf and boards. Our designs, therefore, in this number of the Register, will begin with a cottage, which, although small, has some claims to a pleasant style of living, and which can be made tasteful as well as comfortable. Such a dwelling will be found capacious enough to rear in much refinement an ordinary family, and if substantially built, even of wood, will last two or three generations.

That the smallest of these designs may be the better appreciated, we wish to refer the reader to some remarks made in a previous number of this work, in relation to building small cottages on large farms, for the occupation of the farm laborers and their families. Since the publication of those remarks, we know of several instances where they have been acted on, and have reason to rejoice with those more directly interested, that so good and every way beneficial results have followed the adoption of the plan. We ask tho owners of those large farms who take into their own families the numerous laborers whom they are compelled te employ, to consider a moment if they are pursuing the most judicious course. We acknowledge it may involve less immediate outlay than any other plan, and may in some instances be a trifle less expensive from year to year. But we will suggest once more, whether the saving be not made at the expense of many home comforts, much refinement in the increasing family, and an untold amount of drudgery for the farmer's wives and daughters, that fearfully imperils their continued good health, and reduces them to a servant's knowledge of the world about them, and how to render home attractive, and all its influences pure and healthily stimulating. We are among those who believe that a farmer's home may be as full of grace and beauty, and as suggestive of high hopes as any other. We know of no good reason why they, more than others, should yield their lives and the lives of their families, to the discomforts of a primitive style of life and the hard wearing monotony of thoughtless toil. The

easily attainable possibilities of a nobler life are so much greater than this—the way has been shown in so many living instances, and the reward reaped is so evident and satisfactory, that we are impatient that every dweller in the country should make the most of his opportunities, and labor not alone to put money in his pocket, but also to increase his knowledge, cultivate his appreciation of the beautiful in art and nature, and attune his perceptions to the fine harmonies of a well-ordered, refined life, which unites the whole family circle in constant efforts to promote the general intelligence and happiness.

Our plans and descriptions in this number occupy so much space, that we will not stop longer to discuss the general theme, but proceed to the plans at once. First we give three designs for

WORKING-MEN'S COTTAGES.

DESIGN I.

In accordance with the preceding remarks, the first design we shall present, is one as compact and as moderate in size as will allow of the number of rooms specified. In the perspective view, (fig. 35,) we have chosen to represent a style of construction once very common in the older States and across the ocean, and even now regarded by the best architects as peculiarly adapted to small picturesque cottages. The side

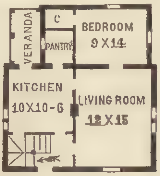
Fig. 35.

walls are only one story in height, which renders the style more suitable than story and a-half houses, when either stone, brick, or concrete is to be used. The tie-beams go directly across from plate to plate, thus preventing all spreading from the pressure of the roof, which is a fruitful source of trouble in one-and-a-half-storied houses. The steep pitch of the roof, to a height sufficient to allow of comfortable rooms in the attic, makes the chambers nearly as large and pleasant as in a house of two full stories, while the cost is considerably less, and much is also gained,

in our opinion, in the picturesque appearance of the exterior, which harmonizes so well with all our ideas of what a small unpretending cottage should be.

The main portion of the cottage is only 16 by 24 feet. A lean-to, 9½ feet in width, is added on the back side. It should be made of good height, coming just under the cornice of the main part, the roof rather flat, and hipped at the ends. One end is left unenclosed for a veranda, as may be seen by reference to the design.

The plan (figs. 36 and 37) needs little explanation. It has one or two points of superiority over most plans usually adopted in so small dwellings, which may be mentioned. It will be noticed that the front door opens into a pretty hall or entry, from which the chambers are reached, and which also gives access to the living-room and the kitchen. This arrangement gives an air of elegance rarely seen in such a cottage, and its mistress will readily appreciate the difference between it and the more common way of compelling every person who wishes to go up-stairs, to pass through the kitchen. The cellar, which should be under the whole of the main part, is reached by a door leading from the kitchen, under the chamber stairs. Two good bed-rooms are provided in the attic, each with ample closets.



36—Principal Floor.

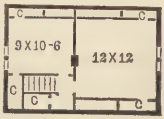


Fig. 37—Chamber.

The window and door hoods, and the verge boards, are the only non-essentials of the exterior. But we believe that whoever builds a cottage like this, can poorly afford to dispense with them. Their cost need be very little, while the air of neatness, content, and rural fitness which they confer, can hardly be over-estimated. If the interior be made to correspond, by taste in its arrangement, by a few pictures and graceful curtains and flowers, a cottage as inexpensive as this may be made to express more of happiness and refinement, than can be got out of many statelier and more ambitious mansions.

Fig. 38—Perspective View.

The estimated cost of this cottage varies from $250 to $350.

DESIGN II.

The accommodation afforded in this design, (perspective view, fig. 38,) is the same as in the preceding one, with the exception of an additional chamber. The kitchen, however, is larger, and the living-room has a pretty window-seat and two closets. This way of obtaining closets in a room which would otherwise be destitute of them, has much to recommend it. It improves the appearance of the room, while it lessens but little its apparent size. The accompanying cut (fig. 39) will give a good idea of their appearance and construction.

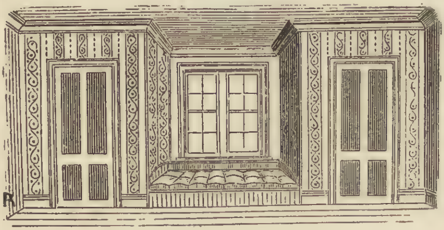


Fig. 39—Window Seat.

The exterior we have given to this design is a very common one, and requires no explanation. It may easily be improved in appearance by carrying up the central portion of the lean-to as high as the main building, as indicated in fig. 40. This arrangement would give an additional room on the second floor. The dotted lines in the chamber plan (fig. 42) show how it might be done. The chimney is located in the center of the house where all its heat is saved, and where it is accessible to the stove funnels on every side. The passage between the kitchen and the living-room may have a door on each side, so as effectually to exclude all noise, heat and odors from the kitchen. The cellar is reached from this passage, and opposite the cellar door is a small closet. The cost will vary from four hundred to five hundred dollars.

Fig. 40.

41—Principal Floor.

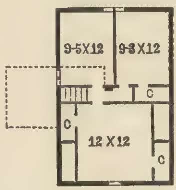


Fig. 42—Chamber.

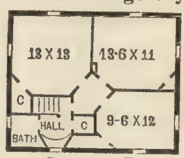
DESIGN III.

This cottage is properly a suburban one, and should not be built far away from some town or village. Its form is well adapted to brick or

Fig. 43—Perspective View.

concrete, as it is nearly a square, and has a broad, overhanging cornice. The square bay in front, the circular-headed door and the double windows, are the distinguishing features of this cottage. The accommodation is about the same as in the two preceding designs. The hall, however, has a more villa-like breadth, and the living-room has three cases of book-shelves, which should be enclosed by glass doors. The large bay increases the size of the room, and adds greatly to its elegance. The bed-room opens from this room in the plan, but can be made to communicate also or solely with the kitchen, if desired.

44—Principal Floor.



45—Chamber Plan.

The kitchen has two good closets, from one of which the cellar stairs descend, and a good-sized pantry. This pantry, and the partly enclosed veranda, and space for fuel, is simply a piazza with enclosed ends. Where neighboring houses are quite near, as is often the case in a suburban district, it is desirable sometimes that some means be adopted to ensure privacy, and we know of no better way than that here indicated.

The arrangement shown in the chamber plan (fig. 45) is a very happy one, as by no other way could so good room be obtained in the same area. The corners cut off supply the necessary closets. The hall has closet and a window-seat, and a bath-room is supplied on the left.

The entire cost will be from $600 to $800.

FARM HOUSES.

DESIGN I.

Fig. 46—Perspective View.

We present this design with some confidence that it will be found to meet the wants of a large class of farmers and other dwellers in the country. It is neither large nor costly. It has neither a pretentious nor a foreign aspect. It seems as if it might have grown out of the soil itself, so modestly does it harmonize with the best features of any cultivated landscape. Yet it is roomy enough for quite a large family, and every room is arranged for home, family enjoyment, rather than for show or for company. Any family which will adapt itself to the suggestions

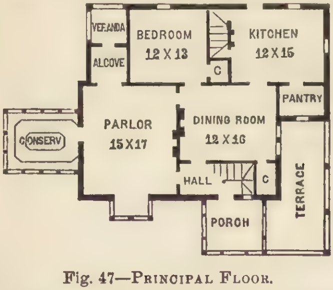


Fig. 47—Principal Floor.

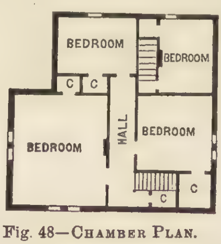


Fig. 48—Chamber Plan.

of refinement and intelligence indicated by the green-house, the bay window and its crowning balcony, the latticed porch and the simple

terrace, need never want more exciting pleasures than those always at command beneath and around the old roof-tree.

The accommodation provided is an entrance hall, a parlor of fair proportions, with a bay window, a glass door through which the plants in the green-house may be seen, and an alcove, which is a small recess cut off the veranda, and only separated from the parlor by an arch, and, if preferred, a fall of drapery. On its left wall a case of books, or articles of curiosity or *vertu*, may be placed; through its farther wall a glass door leads upon a small private veranda, enclosed by a light balustrade; and at the right, a private door gives a "favored few" access to the bed-room. The dining-room with its closet, the kitchen, the back stairs and the pantry, conclude the accommodation given on the first floor, (fig. 47.) Everything in the way of a scullery, dairy, wood-room, &c., can of course be added according to the necessities of each particular case. Four good chambers (fig. 48) are supplied in the attic, each with a closet.

For details of the construction of the conservatory or green-house, see previous numbers of the Register, or special treatises on that subject. In order to give sufficient variety, we must be brief in our remarks and explanations.

The cost of this house will be from $1200 to $1400.

DESIGN II—Alteration of an Old House.

Fig. 49—Principal Floor.

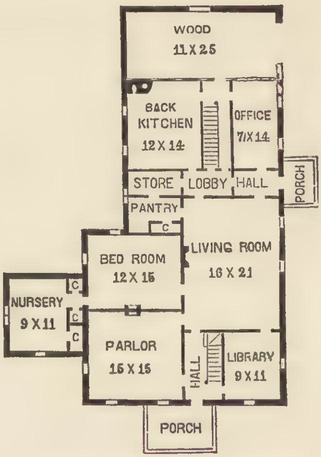


Fig. 50—The Same as Altered.

In all parts of the country there are old-fashioned houses with awkward exteriors, and most ingeniously inconvenient in their internal

arrangements. The accompanying plan (fig. 49) is a specimen of by no means the worst of this class. It is selected because it is the copy of a house now standing in Lamoille Co., Vt., and the alteration shown in fig. 50 is there proposed to be carried out. The points of difference may be briefly stated:

The stair-case of the old house was a close one, with a door at the foot, and the hall afforded entrance to no room but the living-room. In the modified plan, the stair-case is opened, giving a more cheerful aspect to the hall, and doors conduct from it into the parlor and the small room to the right, now proposed to be used as a library and private sitting-room. The living-room is extended six feet into the ell part, and the old bed-room and pantry are thrown together, making one pleasant and roomy sleeping apartment. Beyond this room a small wing has been added for a children's bed-room. The arrangement of closets to accommodate these two rooms, can be seen on the plan. The back hall and stair-case, business office and back-kitchen, occupy part of the space formerly devoted to fuel. Room enough, however, is left for the latter purpose, as the introduction of more economical heating apparatus renders it less necessary to keep so large quantities of wood on hand, as most of our old farmers were obliged to do in the days of enormous fire-places.

We have not thought it necessary to give exterior views, as the chief object in this plan was simply to furnish a hint or two in relation to the improvement of a very common sort of house. It is a fact, however, that it requires more skill and ingenuity to alter an old house economically, and at the same time effectively, than are needed in making an entirely new design. A person of limited experience and observation ought never to go forward in such change, without consulting some person who has had both, and who has, besides, taste enough to make the new harmonize with the old. Old houses frequently, when modified in the right manner, and with a proper feeling of respect for what is venerable, become the most satisfactory of dwellings. They are associated with the past, and interlinked with pleasant memories of youth and the friends of other days. It is an enviable privilege, therefore, which he possesses who inherits an old house, which needs only a few alterations to accommodate it to a newer state of society, while it is still left in all the pride and dignity of a former generation.

DESIGN III.

This design (fig. 51, following page,) is intended more particularly for the suburban or village residence of some professional gentleman who has a love for rural pursuits. It is also well adapted to the wants of a market gardener, and would not be out of place anywhere in the country. If the general plan suits a young man who is not able to carry out the whole design at once, it is so arranged that he need build only a portion at a time, and add the remainder as his necessities and his means increase.

Fig. 51—Perspective View.

The rear of the house, for instance, containing the kitchen, pantry, bedroom, entry and dining-room, may first be built—an arrangement of rooms which would not only be very convenient, but would make a neat-looking cottage. In the plan as here shown, (fig. 52,) we call attention only to the green-house or conservatory, which, with a southern exposure, would be well adapted to a high latitude. The room marked P, the construction of which can be seen in the view, is intended for use as a potting-room. The doors from the green-house to the hall and the dining-room should be glazed. The enjoyment which such a room can be made to afford, can be known only to those who have experienced it. It can be heated (so well is it protected on every side but one,) by the ordinary furnace which warms the rest of the house. The chamber plan calls for no special remark.

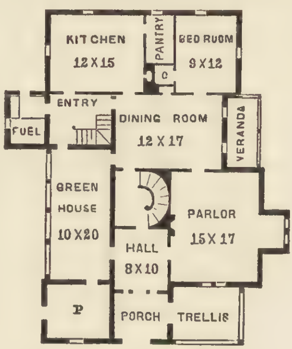


Fig. 52—Principal Floor.

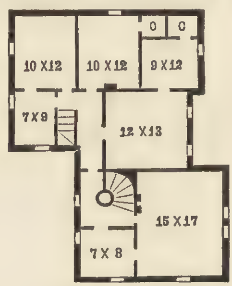


Fig. 53—Chambers.

This house *may* be built of wood for $2,000.

DESIGN IV.

Fig. 54—Perspective View.

For a locality which commands a wide prospect, or one where an outlook over neighboring obstructions is desired, the design here given may prove a satisfactory one. It is intended for a farm-house of the larger class, and if built of solid materials might properly be called a villa. It would, however, make a very satisfactory dwelling built of

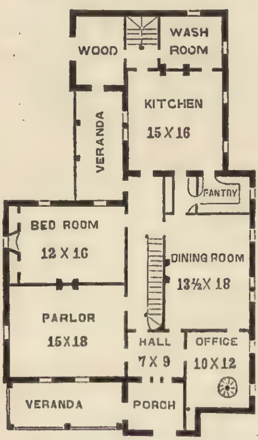


Fig. 55—Principal Floor.

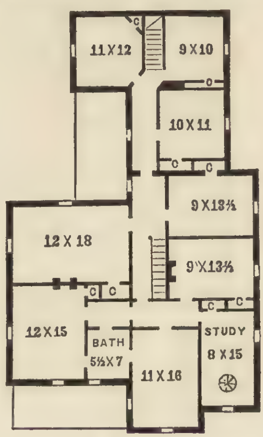


Fig. 56—Chamber Plan.

wood. The accommodation afforded in the ground plan, (fig. 55,) is sufficient for a large family living in liberal style. The office at the right of the hall has a circular stair-case in one corner, leading to a small library or study, which can also be reached from the upper hall. The

two rooms taken together make an arrangement which every "country gentleman" who loves to investigate the sciences which pertain to his sphere of activity, will particularly enjoy. The dining-room and kitchen accommodations are ample, and the stair-case hall through the center of the house makes it cool and airy in summer, and is, besides, very convenient. The chamber plan (fig. 56) furnishes eight sleeping apartments, besides the study. The observatory is reached by circular stairs from the study. This house can be built of wood for not far from $2,200, but at this price there would be no scope for any superfluities of decoration, though every part would be built durably and tastefully.

DESIGN V.

Fig. 57—PERSPECTIVE VIEW.

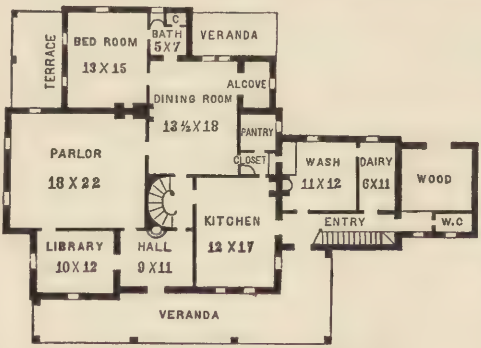


Fig. 58—PRINCIPAL FLOOR.

In this design we have endeavored to furnish a country house, which should have first-class accommodations, large and airy rooms, and still be neither pretentious nor very expensive. We have some confidence that a careful examination of the design will

accord to it these advantages. In its exterior it is somewhat irregular, yet so arranged that the parts harmonize with each other, and join together without those expensive and troublesome gutters, which are often the accompaniment of many stylish houses. The main hall and a portion of the kitchen are in a lean-to, which is carried forward far enough to form the wide veranda. A corner of the dining-room and the adjacent alcove, are formed in the same way on the opposite side. The remaining peculiarities of the design are readily seen from the accompanying plans. The cost need not vary much from $2,500.

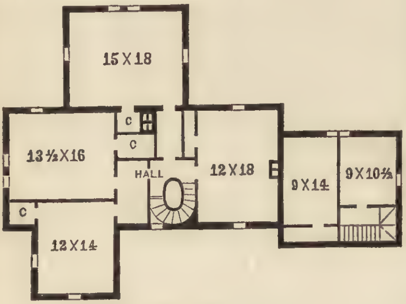


Fig. 59—CHAMBER PLAN.

HEDGES.

Two reasons, which circumstances have rendered powerful, have operated in preventing a more general and successful adoption of hedges. One is the aversion so prevalent, to undertake anything which does not produce immediate results, several years being required to make a perfect hedge. The other is the almost universal notion, adopted without a moment's thought, that everything in the form of a tree must grow and take care of itself. Hence we see, for every good well managed hedge, at least one hundred bad and neglected ones. This remark applies with more force to the attempts made with the Osage Orange than with any other plant, for nothing that is ever used for hedges, is more sensitive under bad usage, or succeeds better if well treated, than this. The privet and the buckthorn will usually present something of a hedgy appearance with any kind of management; but the Osage, unless well cultivated and properly sheared, will not exhibit even the semblance of a hedge. Hence the common notion that it has proved a failure.

Many plants have been employed in hedge-making, with various degrees of success. The English hawthorn was first extensively planted, but with the exception of the most northern parts of the Union, the summer proved too long and hot for its close growth. The native Newcastle and Washington thorns were next largely used; but after hundreds of thousands had been set out, the borer entered them as well as the hawthorn, and swept them off by miles together. The Buckthorn, being

a poisonous plant, has withstood the attacks of all enemies; and being easy to raise from seed, easy to transplant, of natural hedgy growth, and never suckering, has much to recommend it. Its objections are, want of thorns, slow and slender growth, and not flourishing in the shade. It will not succeed well under large trees, which is a comparatively small objection, nor will the *interior* of a close hedge continue dense for the same reason, which is a formidable one. Planted in a fertile soil, and well cultivated for several years, it will form a good hedge in about six years. Where there is danger of cattle dashing through, one or two stout No. 5 wires should be stretched lengthwise through its center.

Evergreen hedges are mostly employed as screens from observation and from winds; but as animals scarcely ever attempt to pass where they cannot look through, perhaps they may yet be used as farm barriers. But we want further experiments. The American Arbor-vitæ is one of the best evergreens for this purpose, but like the buckthorn, it will not grow well in the shade; hence, when closely sheared, the interior branches are bare. Instead, therefore, of being sheared in the common way, it should be shortened back. The close growth of a smoothly shorn surface, darkens and kills the interior foliage, as shown in fig. 60. Fig. 61 represents the same shortened back, or rather *thinned back*, admitting the light within. Fig. 62 shows how this is done, the cut being made at a fork *b*, or still shorter at *a*. The red cedar should be similarly treated.

Fig. 60.

Fig. 61.

Fig. 62.

The *hemlock*, although hardly stout enough for a hedge until it has grown many years, forms one of the most perfect and beautiful screens in existence. Its fresh deep green color is unsurpassed; and its denseness of growth in consequence of its quality of growing in the shade, is scarcely equalled. The Norway spruce will probably prove a fine hedge tree. It grows with great vigor, and may be freely shortened back.

For common farm fencing purposes, the Osage orange has so far been the most promising. It grows rapidly if well cultivated; is sufficiently hardy, except at the extreme north; and is densely armed with sharp and terrible thorns. In order to insure a perfectly continuous and even hedge, the young plants must be allowed to swell their buds before they are set out, that all dead and feeble plants may be rejected. The first winter a light furrow should be plowed upon it, to protect and drain it at the same operation. The soil should be kept deep and mellow by cultivation, at least four or five feet on each side, instead of allowing it to grow up with

weeds and grass, as is usual; and, if possible, it should be placed nearly over a tile drain, which will contribute greatly to its endurance of winter.

The following figures, (a part of which are reduced and improved from those in Warder on Hedges,) will show how this, and indeed all hedges, should be sheared.

The neglect of cutting down at the commencement, causes the hedge to become thin and narrow, and full of gaps at the bottom where it should be the thickest—and dense and impenetrable only at the top, where this is less essential. In other words, the hedge becomes wrong-side-up, or mounted on stilts, (figs. 63 and 64.) The appearance of the young hedge just before cutting down the first time, is shown at *a*, fig. 65, and the cut portion at *b*. It is almost impossible to induce a novice to cut off "all this fine growth"—he thinks it will "ruin" his young and promising fence. Yet if the work is omitted, it will in a few years appear as in fig. 66.

Fig. 63—Badly Pruned Hedge.

Fig. 64.

Fig. 65.

Fig. 66.

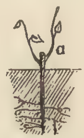


Fig. 67—First Year, Newly Set Out.

Fig. 68—Beginning of Second Year.

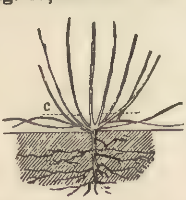


Fig. 69—Beginning of Third Year.

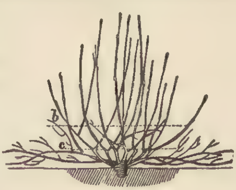


Fig. 70—Summer of Third Year.

The following is the regular order of working each successive year. Fig. 67 represents the plant the first year, or

a few weeks after setting out—it has been cut down nearly to the surface of the earth, the tap-root trimmed off, and the young shoots are starting from it at *a*. It should grow untouched at least one year—some prefer two years, in order that the roots may become thoroughly established. Its appearance the beginning of the second year, is shown in fig. 68—when it is cut down again near the line *b*, to thicken it at the bottom. The result of this cutting down is seen in fig. 69, which shows the same plant after further growth, and which is again to be cut down at the line *c*—this may be done in the spring of the third year, if the hedge has been well managed and kept vigorous. This shearing will not be more than four or five inches high. Nervous people "cannot bear" thus to cut down their beautiful growing hedges—and of course never have a good one. But if the work has been unflinchingly done, the hedge will present by early summer of the third year, the fine broad-based, thickened appearance at the bottom, represented by fig. 70. The next pruning, to be done at the beginning of the fourth year, is shown in fig. 71, as indicated by lines meeting at *e*, when the hedge for the first time begins to assume the form of a roof. The previous shearings (or rather mowings) are shown by the dotted lines *c* and *d*. Fig. 72 shows the subsequent cuttings—first by the lines meeting at *h*, and afterwards at *o*. The latter may be straight, as the previous ones, or in the form of a gothic arch, as shown by the figure. This brings the hedge to the close of the fourth year, when it will begin to form an efficient barrier, if it has been well cultivated and pruned as here indicated. Its breadth at bottom will be nearly double its height. Future years will give it more height; but it must be especially observed to keep it always narrow at top, so that the foliage above shall not shade that below, nor injure the broad thick growth at bottom.

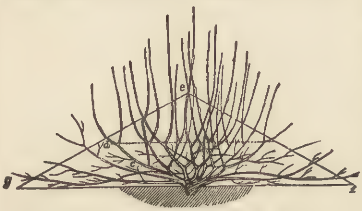


Fig. 71—Beginning of Fourth Year.

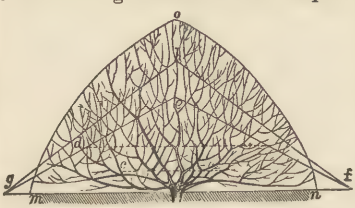


Fig. 72—End of Fourth Year or Beginning of Fifth.

FENCES AND FENCE MAKING.

A MODERATE estimate will show that the entire cost of the fences of the whole country, cannot be less than five hundred million dollars. The reduction of this aggregate expense but one-fifth, would consequently save the country at large a greater sum than the whole value of the Erie Canal and of the New-York Central and Erie Railroads. Every suggestion for cheapening their construction, or rendering them more durable, may contribute essentially to this most important result, and is worthy of the attention of the inquiring farmer.

The common worm or zig-zag fences of the country, with their projecting stakes, occupy a strip of land at least twelve feet wide—occasioning a loss of land equal to this breadth on two sides of every arable field—or half a rod more than is occasioned by a straight boundary. If there are ten million arable acres in the State of New-York, the entire loss in this State alone, from the zig-zag form of fences, cannot be less than three hundred thousand acres of cultivated land—equal to more than three thousand good farms. The importance, therefore, of looking for substitutes for these obstrusive fences is obvious.

POST FENCES.

The durability of fences is the first consideration. The most durable wood should be selected for posts, such as red cedar, white cedar, locust, white oak, and other kinds which resist decay a long time; but the selection of the *kind* of timber merely, is not all. Its durability depends much upon the mode of preparation, and the way in which it is used. If, for instance, posts are cut and set before seasoning, the moist soil may prevent its drying for a long time, until it becomes sap-rotten. If, however, the soil is porous, and happens to be very dry, this bad result may not occur. On the other hand, if the timber is cut at mid-summer, when the air is warm and drying, and placed where evaporation may rapidly take place, the wood will become hard like horn; and such posts set in ground that has a perfect natural drainage, or over an underdrain, will remain dry and last a great number of years. Posts set in wet ground, or where they become thoroughly soaked every spring, and dried every summer, will soon decay.

Wherever, therefore, land slopes in a favorable direction, a post fence should always be placed in a ditch, either over tile, or upon a carefully laid stone channel; and it would be better if sand or gravel be rammed in well around them, to facilitate the downward escape of water. Coarse gravel, or fine broken stone, used for this purpose, would nearly prevent such timber from ever becoming water-soaked; but even compact clay, closely beaten about the post, would tend to keep away much water, as,

closely pounded, it would be water-tight, and the moisture of the earth would pass downward to the ditch, outside of this impervious portion. Cutting the drain under the fence serves to carry off the water from the adjacent land, and especially from that strip that is apt to be hardened by the tread of horses at headlands; and the labor of cutting, with the assistance of a ditching plow, is not greater than digging a row of post-holes alone. Numerous trials indicate that posts will last about one-half longer if inverted from the natural growth but further experiments are needed to prove that this is so under all circumstances. The practice of charring only preserves a thin shell at the outside of the post, and is of little use.

Filling the holes with stones around the post, is now generally discarded, as it becomes impossible to pound them firmly enough to hold the post from sagging; and unless each hole is well drained, they admit every flow of water more freely to the post, thus promoting decay by a constant alternation of moisture and dryness.

The holes should be at least two feet and a-half deep for a common fence, and three to four feet deep for a high or tight fence around barn-yards. They should be large enough to admit freely the pounder on every side; and to make the earth around the post as hard as a brick, only two or three ounces of earth should be thrown in at a time, and beaten quite hard before more is added. The pounder should be a straight stick, about five and a-half feet long, the size of a pitchfork handle above, and two inches by an inch on its face or end, where it should be shod with an iron head. If the earth is quite moist, it cannot be compactly beaten, and for this reason the posts should not be set in a wet season of the year. If too dry, which rarely happens, the addition of a little water occasionally from a watering pot, will promote very close packing.

To set the posts perfectly straight, a line must first be stretched, and a peg stuck into the ground at the place for each post; the line is then removed, and the holes dug, each peg forming the center of the hole. If a ditch is cut, as already recommended, the only care required so far, is to have it straight. Next, whether in holes or in the ditch, two posts are to be carefully set by the plumb, at several rods distance from each other, and accurately on the line. Two strong cords are then stretched across the face of each post, connecting them, one near the ground and the other near the top. The face of every intermediate post is then placed just touching these lines, and all are thus set upright and in a right line, with the greatest facility. The cords will not be strong enough unless about a fourth of an inch in diameter, and two workmen will set posts twice as fast with as without them, and with greater accuracy besides.

In nailing on the boards, the top board is first to be very accurately

placed, as a guide for the rest of the fence. Where the surface of the ground is level, the top of this board should be perfectly straight, which may be done by stretching a cord tightly across the face of the line of posts, raising it from the slight curve it falls into, by a nail driven a quarter of an inch into each post. A little experience will enable any one to dispense with the use of the line, driving the nails in an exact range. Against this line of nails, the top board is to be placed and secured by nailing.

Where the surface of the ground is uneven, the fence, to suit it, should not be broken into awkward and irregular angles, but should pass over it by a succession of graceful curves. Such curves are easily made by a row of nails as already stated, each successive nail being driven a quarter of an inch or less, above the right line, in passing over a hollow, and below the right line, when rounding over a hill. These successive distances are easily estimated by the eye, with sufficient accuracy, without measuring. The accompanying figure, (fig. 73,) strongly represented, to

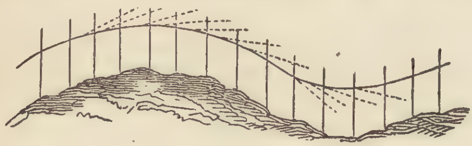


Fig. 73.

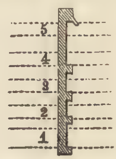


Fig. 74.

exhibit more plainly, will show how this is done. An experienced hand will thus lay off fifty rods in half a day. Marking the height of the fence on every fifth post with chalk, previously, will be useful.

To assist in nailing on the other boards, accurately and rapidly, procure two pieces of board, the length of which is to be equal to the height of the fence, or a little more, and saw notches in them, as represented in fig. 74. The projections thus left, support the boards while they are nailed to the posts, these pieces of board being hung, by the upper projection, upon the top board, already in its place. All the distances

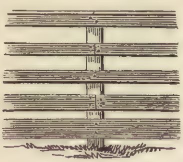


Fig. 75.

Fig. 76.

between the different boards are thus measured without error, and one hand will proceed alone with the work as fast as two could do without this contrivance.

The boards should be made to break joints, as shown in fig. 75, and if

well secured with strong nails, will entirely obviate the necessity of the *facing boards*, usually placed upright over the joints, which, by retaining moisture, generally cause decay at the ends of the boards after the lapse of several years.

A cap-board always serves to stiffen and strengthen the top, as well as to shelter from water the joints of the upper board. It is easily and very neatly nailed on, as shown in fig. 76, by first laying the cap-board so as to overlap the preceding one, and nailing it at the other end and middle. Then saw off both these lapping ends with one cut of the saw, setting it with a slope just equal to the width of the cut, when both will accurately coincide, and form the perfect joint shown in fig. 77.

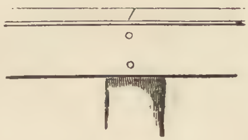


Fig. 77.

Fig. 78.

Fig. 79.

When it is desired to form a fence of great strength, so as to endure the assaults of unruly cattle and ferocious colts, two top-boards should be nailed on opposite sides, surmounted by a stout cap, as shown in the section, fig. 78. This has proved entirely successful as a boundary fence, where nothing before had withstood a herd of furious horses.

A proper width for the boards and of the spaces between them, is a matter of some importance. A neat fence is shown in fig. 79. The bottom board is 6 inches wide; the four next 4 inches; the top board 3 inches, and the cap 4 inches. The spaces are 3, 3½, 4, 4½, and 5 inches. Fig. 75, (preceding page,) represents a heavier fence, better adapted to ordinary purposes, the lower board being 7 or 8 inches, the next 6, and the three upper 5 inches. Where boards are knotty, it is safer to have them at least 5 or 6 inches wide; but a lighter appearance is given by narrower strips, and less stuff is required. Tough kinds of wood, liable to warp, as, for example, elm, should be sawed as narrow as 3 inches, and not over seven-eighths thick; and then, being well nailed before dry, they will be held securely in place, and not draw nails nor become distorted in seasoning. If cut in summer, when they may season quickly, they will last much longer.

Picket fences, as they are termed, cannot be recommended for their appearance, but only as a method of security in preventing the ingress of intruders.

The following figures (figs. 80 and 81,) represent finished but picturesque fences to accompany Cottage-Gothic buildings. They are made of smooth lumber, and should be painted light brown. Posts are first

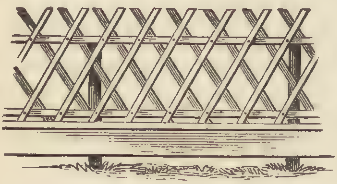


Fig. 80.

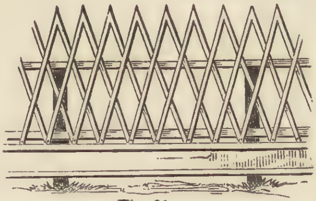


Fig. 81.

set, and stout horizontal rails secured nearly as in making a common picket fence. These rails are scantling, 2 by 3 inches, let into the posts, and the lower one high enough to admit a board about a foot wide at bottom. The height of the fence shown in fig. 80, above this board, is about 3 feet, making more than 4 feet in all; the strips of picket stuff, being inclined as shown in the figure, must be 3 feet 9 inches long. They are nailed on opposite sides of the horizontal rails, and form a stiff fence.* In fig. 81, the fence is higher, and intended to exclude fowls from a garden. The pickets are 4 feet long, 2 inches wide, and an inch thick, and are nailed on the same side of the rails. In both instances, 2 feet is a sufficient distance between the upper and lower rail.

All fences not of split or rough rails, should be protected from decay by a coating of paint or of lime wash—the former for planed wood, and the latter for rough or sawed surfaces.

The construction of iron fences was described in the Register for last year.

HURDLES AND CHEAP FENCES.

A hurdle fence, made of sawed stuff, is shown by fig. 82; the posts of which are $2\frac{1}{2}$ inches square, the rails $2\frac{1}{2}$ by 3-4th inch, morticed through the posts, and secured by $2\frac{1}{2}$ inch cut-nails. The braces and cross-bar are merely laid on, and are fastened to each rail with

Fig. 82.

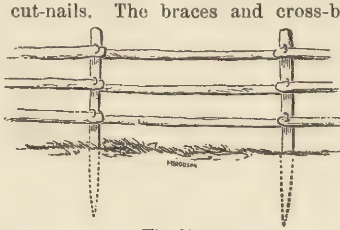


Fig. 83.

annealed cut nails clenched. The fence is put up by making a hole a foot deep, or a foot and a-half if in soft earth, for each post, and fastening them at the top with a pin. This may be made for about a dollar a rod, and we have found it answer an excellent purpose for a movable

* The figure is wrong in one particular—the pickets on the other side are *beyond* the posts, and are let into them where they are thicker than the width of the rail.

fence. These hurdles may be made more cheaply, nearly as strong, and lighter, by "letting-in" the rails slightly into the posts, and securing each by a stout annealed nail.

Fig. 83 shows a cheaper temporary fence, intended for confining cattle or horses only. It is made of common split rails, attached to posts by means of annealed fence-wire, thrust through half-inch auger holes made for the purpose, and secured by a twist. One good rail will make two posts, which are set about 20 inches deep into crowbar holes. The meeting ends of the rails are placed on opposite sides of the post, and both are held by one wire, as shown by fig. 84. This fence will cost from 40 to 50 cents a rod, including rails, wire and labor.

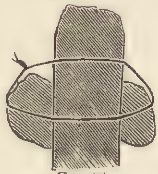


Fig. 84.

Another fence, more portable in form, sometimes used on western prairies, where winds are violent, is represented by fig. 85. It is very cheap, but not neat in appearance. Short sticks are mortised as represented, to form a support, to which common fence rails, or poles, are

Fig. 85.

Fig. 86.

nailed. A rider is added without nailing, as is exhibited in fig. 86. It stands firmly upon the ground, and may be moved with great facility. It is as cheap as the preceding, and more durable.

Many patents were taken out a few years since, for movable board fences, made first into separate panels, and then set zig-zag for support, locking together at the ends. As such fences obviate the necessity of providing posts and digging holes, they were made cheaply, or for 60 or 70 cents a rod, but were of no value except in sheltered localities. Strong winds have frequently upset long portions at a single blast, and on the whole they cannot be recommended.

Zig-zag fences have been successfully constructed, however, by using timber that exposes but little surface to the wind. One form is made by boring holes at 6 inches distance along the whole length of two horizontal rails, and forming pannels by inserting round 4-feet sticks through these holes. They are fastened at the ends by thrusting the same stick through the holes of the two connected ends of the rails. Another form is shown by fig. 87. It consists of six rails, 13 feet long, sawed of tough timber, $2\frac{1}{2}$ or 3 inches wide, and $1\frac{1}{4}$ inch thick. These are placed respectively at distances of 4, 5, 6, 7, and 8 inches, and secured by wrought nails to cross-bars or battens, as represented.

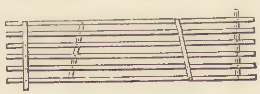


Fig. 87—Watson's Fence.

A 13-feet rail will make three of these battens without loss of stuff, and they are placed on alternate sides for binding the fence more securely at the corners. When placed in position, the ends interlock, and are connected by a loop of No. 9 annealed wire. The acuteness of the angles is determined by the length of this loop, and the fence is thus modified for windy or sheltered places. The cost is about 50 cents a rod.

FARM GATES.

Many a farmer, discarding the awkward machinery of "bars" for field entrances, has erected gates, which at first gave perfect satisfaction. They would swing easily on their hinges, latch with precision, and present a neat and handsome appearance, (fig. 88.) But every gate tends to sag, and in a few years the fine qualities of the farm gate have departed; it no longer swings upon its hinges, but is dragged by force over the ground in opening and closing; its self-latching contrivance has given way to a cord loop thrown over the post, and at a still later period the hinges are gone, and it is "scotched" with a rail, (fig. 89.)

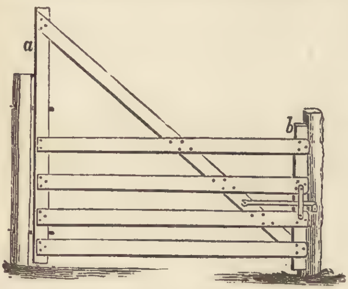


Fig. 88.

Such a discouraging result is not, however, necessarily connected with the farm gate. To retain its form it should be well braced, and as light as proper strength will admit. When the brace is of wood,

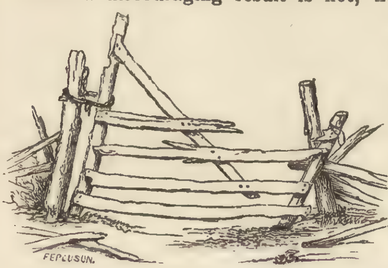


Fig. 89.

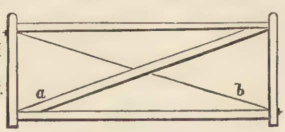


Fig. 90.

(*a*, fig. 90,) the pressure should be against its ends, because it may be secured more completely if set firmly against the wooden frame, than if merely fastened by nails in serving as a tie. But if an iron rod, *b*, is used, not being stiff enough as a brace, it can only act in the contrary

direction with a screw and nut at each end. Whence the general rule —use wood as a *brace*, and iron as a *tie*.

But a more frequent and greater cause of sagging than the distortion of the gate, is the settling of the post. This is prevented by digging deep holes; by using a large post that shall present a broad surface against the earth; but still better, by setting a large flat stone upright in the ground, so that the post shall press against its face. The earth, in filling the hole, must of course be firmly rammed or beaten, by adding small portions at a time; and the same treatment must be given to the earth against the flat stone. Posts may be very firmly set by building masonry of water-lime about them, placing most of it on the sagging side; but as frost will destroy it, this can be used only to advantage where the earth freezes but a few inches deep, an earth-covering protecting the top.

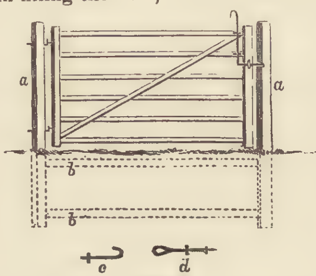


Fig. 91.

Fig. 91 shows the manner in which posts are kept from settling by connecting timbers *b b*, placed in a ditch, afterwards filled with earth. These connecting pieces will do if of large scantling, and may be mortised into the posts. A single stout rail, laid a few inches below the surface, and accurately fitted, without mortising, will be found quite useful.

HANGING THE GATE.

A gate hung exactly perpendicular, will turn freely in every direction through the circle, and will remain at rest at any point. To be a self-shutter, it must be hung with an inclination. If the dotted line, for example, on the face of the post, (fig. 92,) be drawn with a plumb line, the upper hinge must be inserted an inch to the left of this line, at *a*, and the lower an inch to the right, at *b*, to cause the gate to fall toward *c*. But if opened more than the quarter of a circle, it will then begin to fall wider open. To prevent this, the turning point of the upper hinge, (*a*, fig. 93,) should be about two inches nearer the gate from the (dotted) plumb line, than the lower hinge *b*. The gate will then fall shut if not opened more than three-fourths of the semi-circle—which is about as wide as is generally needed. Beyond this, it is desirable that it remain open, without fastening, as a matter of convenience when passing through. The same end will be attained if the

Fig. 92.

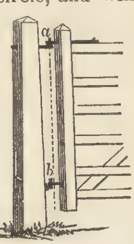


Fig. 93.

post itself is made to incline about two inches, the hinges in this case being set in the center of the post. If it incline directly towards the latch-post, the gate will fall shut through a fourth of the circle; if it incline besides with the direction of its motion, it will fall through a larger portion. This may be effected either by using a plumb line, or by hanging the gate when the post is partly set, and then fixing its position after opening and shutting, until the right inclination is found. The latch-post must have the same inclination, in order that the gate may strike it without twisting.

Another advantage in a self-shutting gate of this kind is that it rises in an inclined plane when opened, passing over snow-drifts and other obstructions. The height to which it rises exceeds the deviation from the perpendicular, as much as the length of the gate exceeds its height. For example, if the hinges are three feet apart and two inches out of the plumb line, a gate twelve feet long will raise eight inches in opening—if the hinges deviate four inches, the gate will rise sixteen inches—which may be desirable where deep snows are prevalent.

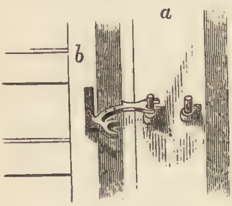


Fig. 94—Double Hinge, for Swinging both ways.

A gate that is often passed should open both ways. To effect this object, the upper hinge is made as usual; but the lower one is double, or consists of two hinges placed a few inches apart horizontally. Instead of a ring to fit the hook, as in the common hinge, there is only a *fork* to admit of its being thrown out, and each hinge is brought into use alternately, as the gate is swung one way or the other. Fig. 94 represents this double hinge, *a* being the gate-post, and *b* the gate as seen open, the further hinge being in place, the nearer one thrown out by the process of opening. As the gate is thrown one way or the other, each fork of the hinge grasps its corresponding hook alternately. Both of these hooks being outside the plumb line, the gate falls shut from both sides. The notch for the latch is commonly made as shown in fig. 95, but as the sudden arrest of motion when the latch drops into it, jars and racks the gate, it is better to round the corners of this notch as in fig. 96, so that the latch will glance over it while alternately striking from either side, until the force is gradually spent. An important advantage of this kind of hinge is, that the gate is not beaten to pieces in striking forcibly against the post.

Fig. 95.

Fig. 96.

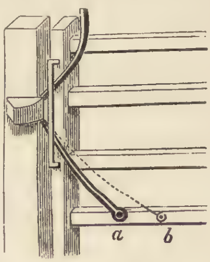


Fig. 97.

Fig. 97, (preceding page,) represents an excellent and cheap gate-latch, made by bending a half-inch rod of iron into the shape indicated, and fastening it by an iron pin on which it moves at *a*. Its weight causes it to fall against the post. If bent in the direction of the dotted line, and moving on a pin at *b*, it will fall more quickly. This latch, if well made, will last as long as the gate; and if the gate sags two or three inches, it is not thrown out of place.

A self-shutting gate should always be a self-fastener—otherwise careless persons will leave it unlatched although closed, to be thrust open by unruly animals, or blown open by wind.

CONSTRUCTING THE GATE.

The upper horizontal bar may be tough ash, which preserves its straight form; the head-piece sound elm, which is difficult to split; and the heel-piece may be white oak, on account of its durability. The latter may be heavy, or three by five inches or even more, that it may be strong and form the basis of the rest of the frame. Its weight is but little objection, as it moves but a few inches, and consequently has little momentum, and drags but slightly by its weight on the hinges. The head-piece, on the contrary, and all the frame at that end of the gate, should be as light as possible, as every pound there bears with a leverage of several pounds upon the hinges, and strikes the post with a great momentum. Those who are not acquainted with these mechanical principles, sometimes make both ends alike, and as a consequence the gates are soon beaten to pieces, or sag irretrievably.

Fig. 88, at the beginning of this article, is a cheap and easily made gate, which any farmer may construct. The heel-piece is 3 by 3 scantling, the head-piece 2 by 3; the brace is a board which is first let into the scantling, and then the other boards simply nailed on. The objection to this gate is that the brace is used as a tie; which, however, may be nearly obviated where light materials are employed, by using plenty of good wrought nails in connecting it with the gate. Such a gate as this need not cost more than a dollar, and is less expensive than a set of bars.

The best gate for common farm uses is one constructed by Dr. D. A. Robinson of Union Springs, N. Y., made up of a combination of various parts which he had met with in use, (fig. 98.)

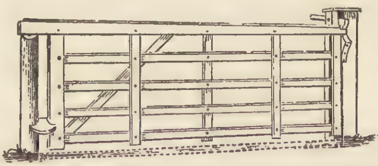


Fig. 98—Robinson's Farm Gate, (not patented.)

It may be made of any light, tough and durable wood, but answers a good purpose when of pine, with the upright or cross-bars of white oak. The upper horizontal bar is 11 feet long, 3 inches wide horizontally, and 5 inches deep at the hinge, and 2½ at the latch. Its mortises are only two-thirds through, to shut out rain, and

5-8ths by 3 inches—except of the heel-piece it is an inch and a-quarter. The heel-piece is 3 by 5 inches, and the four lower bars are boards 1 by 5 inches. The cross-bars, the brace, and the two pieces forming the head-piece are 1 by 3 inches. They are secured at each crossing by wrought or annealed nails. The head-piece consists merely of two boards, nailed on each side of the horizontal boards. All the stuff forming the frame of the gate proper being 3 inches wide, may be sawed with little waste from the log; and the top bar by sawing alternately, for the taper. The gate is 4 feet high.

An important advantage is the protection of every mortise, and of the hinge and latch, from the weather. The hinge is made by driving an iron rod, at least three-fourths of an inch in diameter, into the top of the post, (fig. 99,) which turns in a hole seven-eighths of an inch, bored two-thirds of the distance through the large end of the upper bar. A short iron plug driven into this hole, makes a hard resting point that will not wear, for the gate to turn upon. Fig. 100 shows the wooden collar which fits the round post and completes the hinge.

Fig. 99.

Fig. 100.

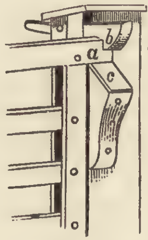


Fig. 101.

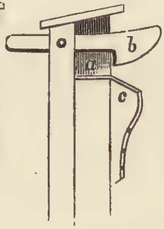


Fig. 102.

The latch being fastened to the fixed post at the head, and not to the gate itself, may be made stouter and more durable, and the gate not being encumbered with it, is less liable to be injured or broken, and swings lighter and freer on the hinges. The end of the bar itself, (*a*, fig. 101,) with the massive latch *b*, (the latter only rising as the gate shuts, and dropping again to secure it,) constitute a very strong fastening. The inclined plane *c*, which is faced with thick sheet-tin, (figs. 101 and 102,) is added only to facilitate fastening when the gate sags, as all wooden gates will, but this less than others, *because there is no weight whatever straining the hinges, except while the gate is open.* A pin or spike is driven into the post on which the hinges turn, just above the lower hinge, to prevent hogs or other animals from lifting the gate, and which does not prevent it from being placed on its hinges while open. The post holding the latch may be rough except the face; and the other need be rounded only where the hinge turns.

The whole cost of the hinges need not exceed ten cents, and the gate itself may be made at no greater expense than a common set of bars.

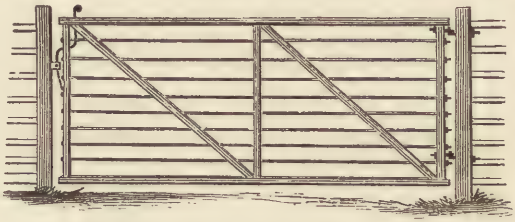


Fig. 103—Wire Gate with Wooden Frame.

Fig. 103, represents a neat and light gate, made of iron rods passing through a wooden frame. It is well adapted to all self-fastening latches, for being light its momentum is but little, and it is not, therefore, easily jarred to pieces. It catches but little wind, and will not occasion snow-drifts. If intended as an entrance gate to a dwelling, the dimensions may be as follows: Length 10 feet, height 4 feet; heel-piece (of white oak,) 3 by 3½ inches, and 3 feet 8 inches long; latch-piece same length, and 2 by 3 inches; braces and cross-bar, and top and bottom horizontal bars, all 1 1-4 by 3 3-4 inches; rods round, 3-8ths of an inch diameter, and secured by heads at one end, and nuts and screws at the other. They are eight in number, and nearer together at the bottom.

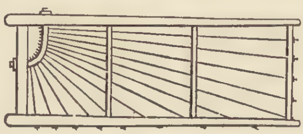


Fig. 104.

Another form of the wire gate is shown in fig. 104. Its chief advantage is that every wire forms a tie, passing through the wooden frame at different points, and the stout iron brace at the upper left corner. Such a gate as this, well made, can never sag perceptibly, and is not expensive.

Iron rings driven on the ends of the timbers, contribute to the strength and endurance of gates, and the practice of bracing the corners with iron, would doubtless be advantageous for gates in constant use.

BARNS AND STABLES.

Former numbers of the Register contain many plans of barns, which are commended to the attention of those who desire information on the subject. A few are here added, which possess some peculiar advantages. The first (figs. 105 & 106,) is of a very neat brick horse-barn belonging to a friend,—built with an especial view to cleanliness and perfect ventilation. Its dimensions are about 22 by 36 feet—it has four horse-stalls, surrounded on each side with open passages, admitting freely both light and air. Hay

from the "hay-shute" drops from the loft above into the feeding passage, and is readily given to the horses through broad openings in front of their heads, about four feet high. These openings are substantially lined with thick sheet iron to prevent gnawing. The partition containing these openings does not extend up to the ceiling above, and the partitions between the stalls are only high enough to effect a proper separation, allowing a free circulation of air. The passage over which the ventilator is situated, is used for clearing away the manure. The ventilator passes up through the center of the hay loft, and supports the roof. A harness and saddle room is under the stairs. A large cistern holds water enough for the use of the horses, and is brought up by a pump at the end of the feeding passage.


Fig. 105—Horse Barn.

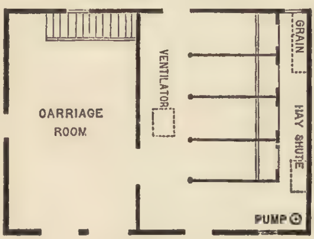


Fig. 106.

The accompanying plan and view (figs. 107 and 108,) represents a barn adapted to a farm of moderate size, erected by E. W. Herendeen, of Macedon, N. Y., on a tenant farm. It is neat and compact, and has been found to combine many conveniences for a barn of such moderate ex-


Fig. 107.—Barn for Small Farm.

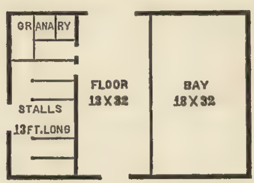


Fig. 108.

pense, the whole having been built for about five hundred dollars. It is 32 by 44 feet, and with posts 18 feet high. It is very substantially built—the siding being vertical unplaned boards—the doors hung on iron rollers—and the floors made of two inch pine plank, planed and matched. The basement is occupied as cow stables and shed. The horse stables are above, experience having proved that horses are healthier above

ground. The stable door is at the end of the building, as shown in the view; and directly in front of this door is a wide stall, admitting a span of horses in harness side by side when desirable.

BARN FOR HORSES AND CATTLE.

A friend who raises a large number of horses, has furnished the following convenient plan of a building for extensive accommodations. (Fig. 109.) It is placed on moderately sloping ground, the building for hay and roots being on the higher part, and the line of stables gradually descending towards the "straw barn." The "bridge" furnishes ready access for loads of hay, and by raising two or three plank from this bridge, cart-loads of roots are readily dumped down a shute into the root-cellar. The bay on each side the root-cellar serves as a protection from frost, to which may be added when necessary a thick layer of straw. In front of this root-cellar is the area for cutting roots, hay, and straw.

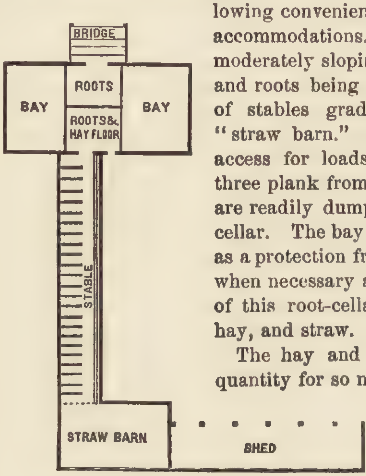


Fig. 109.

The hay and roots, which must be in large quantity for so many animals, is carried along on a rail-car with little labor. Fig. 110, is a cross-section of the part of the building in front of the line of stalls, showing this car, which hangs on a single rail above, over which it moves on an iron roller or wheel; and below this car is a larger horizontal wheel, which rolls against a wooden rail fastened to the wall. The car thus moves freely—the load is held by vertical iron rods in front. The slightly descending grade increases the ease of motion; and when emptied, it is easily moved back to the hay barn. Fig. 111 is an enlarged cross-section of the upper rail and roller which sustains the car.

Fig. 111.

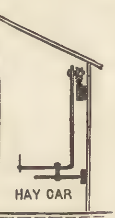


Fig. 110.

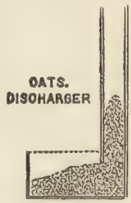


Fig. 112.

The granary being placed above, a self-regulating discharger supplies oats below. A section is shown in fig. 112, where a wooden box tube, connected with the bottom of the granary, is at all times full of oats, which descending into the horizontal trough open at top, furnishes a supply as fast as it is dipped out. If the bottom of the granary is hopper-shaped, it will serve more completely to discharge the contents.

STALLS FOR HORSES.

The partitions between the stalls should be stout enough to resist pressure and kicking, and be not higher than safety requires, so as not to impede a proper circulation of air- Fig. 113, represents a common form, made by setting a stout vertical post from floor to joist overhead, from which a stout scantling proceeds in an inclined position to the head of the stall to hold the partition plank. The under side of this scantling is grooved to receive the ends of the plank. The only objection to this partition is that lively horses in kicking sometimes get their feet over the partition, the post holding them fast. In one case it became necessary to cut down the partition, and in another to lift the horse by a tackle. This difficulty is obviated by the form shown in fig. 114, which, however is not high enough in the rear, unless running nearly across the passage. The best form is exhibited in fig. 115, where a stout curved cast-iron rail receives the partition plank—*a*, showing a cross-section of this rail. Such a cast rail should not weigh less than 300 lbs.

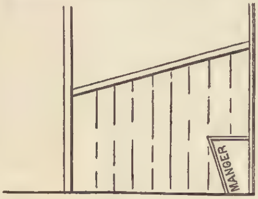


Fig. 113.

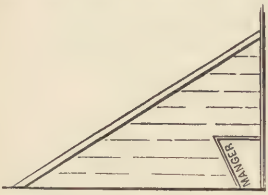


Fig. 114.

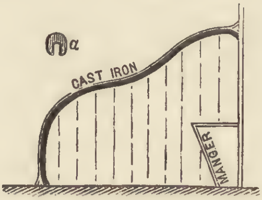


Fig. 115.

The partitions should be about seven feet high at the head, and average about four feet at the rear; they are usually made about seven feet long, but six feet in length is preferred by some, as allowing better ventilation. The stalls should be at least five feet wide—the whole width of the stable never less than 12 feet, and the height at least 9 feet—many prefer 12 feet; but if thorough ventilation is effected, 9 feet would be better than 12 feet without it.

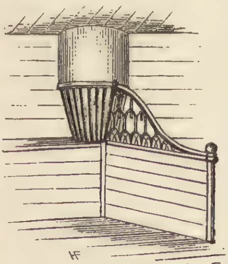


Fig. 116.

In the preceding figures, the manger is represented as the place for holding all the feed, the hay being thrown down through an opening above. This course is adopted by many for the purpose of keeping horses' heads clear

of hay-seed, as well as for greater ease in feeding. Where racks are preferred, fig. 116, shows an excellent plan, representing a semi-circular opening from above with an iron rack underneath. At the bottom of this rack, is a cast-iron manger 15 inches wide. The post which forms the rear of the partition, and the ornamented portion of this partition are of cast-iron. The stable from which this sketch was made, was 12 feet high and 15 feet wide; the shute or opening was 4 feet wide or diameter,

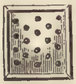


Fig. 117.

and cased with sheet iron; the iron rack was 3 feet high, four feet wide at top and 2 feet at bottom, and serves for two stalls. Drainage in each stall was effected by means of a cast-iron plate (fig 117,) set in the floor, a foot square, slightly concave (half an inch depressed,) and perforated with holes.

CATTLE STALLS.

The stalls vary in construction according to the method adopted for fastening the cattle. As a general rule, the more liberty the animal has for moving about, the more care is required for littering, and vice versa. When every animal is separated from the others, each in its stall, and by a gate, no other fastening is employed. The stalls in this case need not be more than three and a half feet wide, so that animals of ordinary size will not turn about in them; but as they may pass backward and forward, plenty of litter will be required, to maintain proper cleanliness. Where cows are large, the width should be greater. The entire length should be about 14 feet—at least two feet for the manger, 7 feet for the cow (very large will need 8 ft.) one foot for the manure gutter, and about 3 feet for clearing away manure, passing for milking, &c. When gates are used for separating the animals, they may either extend the whole length from the manger to the rear of the stable, or what is rather better only a part of the way, the remainder being occupied with partitions between the animals. The gates all swinging one way, the outer one is opened first, and the occupant of the first stall marches out, and so on successively, till the whole stable is vacated. When they return, a reversed order is observed, the inner one being secured first, and so on. Fig. 118, represents the position of these gates when open, and fig. 119, as shut. This is the usual way in which such gates are made to work, but a neater and much more convenient way is to have these gates run on rollers on an iron bar overhead, and the attendant

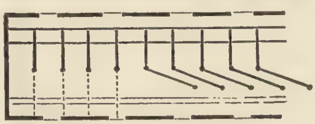


Fig. 119. Fig. 118.

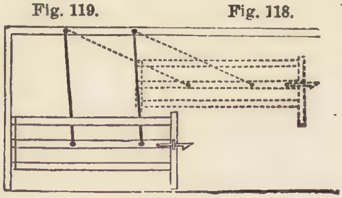


Fig. 120.

standing in the feeding alley at the heads of the animals. opens and closes their gates by an iron hook on the end of a stick about the size of a rake handle, without leaving the alley. Another way is shown in fig. 120, where the gates, made of three light bars, are hung by two iron rods to the scantling cross-beam overhead which separates each stall, and they are opened as already stated by the hook from the feeding alley in front of the animals, and are secured by the simple wooden latch, shown in fig. 121. When the animals take their places, these latches are successively raised, and the gates fall back and shut. A double bar forms the top of the gate, between which the suspending-rods play and are thus kept firmly to their places. They shut in between two upright studs, and are thus more firmly held to their position, and are not likely to be crowded against or broken, as in the case of hinges. Another advantage of this mode is, that any one of the gates may at any time be opened, and two or more stalls be thrown into one for a cow about to calve, or for any other purpose.

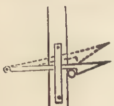


Fig. 121.

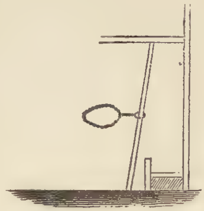


Fig. 122.

Another mode of securing cows, frequently adopted, quite comfortable for the animal, but attended with some labor in fastening and loosening, is the sliding halter, shown in fig. 122. The stake or post on which it slides is slightly inclined, to give more room in lying down, and is placed just without the manger. An iron ring or chain loop, sliding easily, encloses the stake, and a smooth chain, attached to this, passes around the neck of the animal, and is fastened by a broad-tongued hook, which is put into any link forming a proper size for the neck, and cannot come out until turned edge-wise by the hand. A strap and buckle is sometimes used for the same purpose, but is less durable.

A third mode of securing the animal is by stanchions. Unlike the preceding, these prevent the animal from bending its head to its sides. Each one consists of two upright stakes or strips of plank, placed just far enough apart for the neck to move up and down freely, but not allowing the escape of the head. One of the strips is movable at the top so as to slide open wide enough to admit the head of the animal, when it is returned to its place, and secured by a pin—its upper end sliding between two bars of wood. Cows are quickly secured to their places by this contrivance, and it has one important advantage over the other modes already described, by not allowing them to step backward beyond a certain line nor to lie down on their droppings—for this reason less care is required in littering them. In a large milk establishment, where nearly a hundred cows were kept, the owner had all the movable stakes of these stanchions secured to a long rod, by which every cow was released

by a single movement of the hand; and when they returned to their places and began eating their messes, a like movement fastened every one.

In all cases where cows are secured at the head, the partitions between the stalls should extend backwards from the manger about five feet, and to admit the free circulation of air, should not be more than four feet high. These partitions may be made thus: Set a post of cedar or other durable wood firmly into the ground to form the rear of the division,

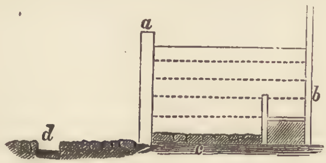


Fig. 123.

Fig. 124.

a, fig. 123; this has a groove chisseled into it, to receive the partition plank; another grove for the other end is made in a stud at the back of manger, *b*. To prevent the decay of these plank, they should rest on curb-stone, *c*, set into the ground. The floor on which the fore feet stand, and on which the animals must kneel in lying down and rising, should be compact earth, well covered with straw, so as to be soft and comfortable. The hinder portion of the floor should be paved, or flagged with very thick solid flag-stones. A gutter, *d*, for the manure should be formed of smooth flag-stones, with curb-stones on each side, so that it may be just wide enough for a common square shovel to work in, and by which it may be easily and effectually cleaned. This gutter may be made of plank, but this soon decays. Stalls are often made seven feet wide, each for two animals, a stout post only being placed midway between them, fig. 124. This has the advantage of securing more circulation of air, and more room for cleaning.

The manger should be at least two feet wide, and if intended to hold roots, meal, &c., should be a foot higher at the bottom than the animals' feet. If only for hay, it may extend down to the floor, the feeding being given in movable tubs holding each about five gallons, which have the advantage of being easily and thoroughly cleaned for each successive meal,—cattle, as well as animals of a higher order, not liking to eat from dirty vessels.

RACK FOR FEEDING CATTLE.

The annexed figure (fig. 125,) represents a secure trough and rack, which has many advantages. The rack is horizontal, and covers the box or trough. It turns up like the lid of a chest, and rests while open against the board *a*, which is a little inclined outwards, by being nailed on the slightly diverging side of the box. The hay is then thrown in, and the rack shut down upon it. Secured in this way, the hay can scarcely be wasted at all; it is very convenient for the cattle to reach; they cannot

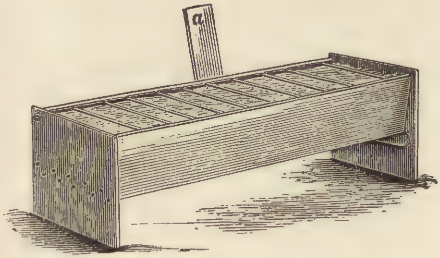


Fig. 125—Cattle Rack.

get into it; and it may be used for feeding roots, cut straw, &c. This rack may be of any desired size; a convenient length is 6 to 12 feet, width about two and a half feet, and the height a little over two feet. The depth of the box may be ten inches or a foot, and the spaces in the rack nine or ten inches. It should be a little wider than the figure represents, and the end pieces on which it stands, will usually require battening.

SHEEP RACKS.

Where large flocks of sheep are to be fed, and large quantities of hay are consumed by them, convenient racks and troughs not only contribute to the improvement of the animals, but prevent tons of hay from being trodden under foot and wasted. Their best construction is a matter of some importance; some are costly, cumbersome, and inconvenient; others are neat, cheap, and exactly fitted to their intended purpose.

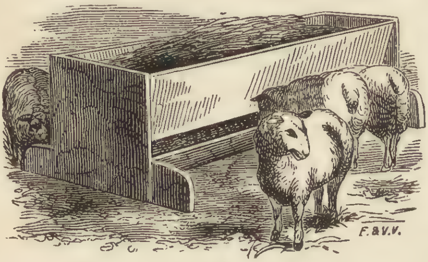


Fig. 126.

A feeding trough which has been highly recommended, is shown in figure 126. It is made about two and a half or three feet high; the hay is thrown in at the top and drawn out on each side near the bottom. Fig. 127, shows a cross section, and exhibits the double feeding trough *bb*, which is used for grain and chopped roots. The feet *aa*, resting on the ground should be of double plank, and notched at *bb*, to receive the boards forming the troughs. The advantages of this trough are, it does not waste hay, and answers at the same time for a place for feeding grain and roots. Its disadvantages are,—it is rather heavy; the hay, unless

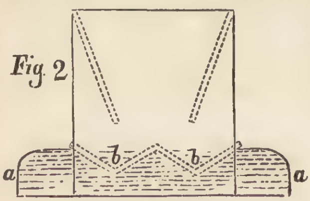


Fig. 127.

carefully placed, will not descend well, and the sheep will not get their entire meal; and the troughs are rather difficult to clean. But it is incomparably better than the old way of throwing hay into the mud, to be worked in by the animals' feet.

A rather more elaborate and finished trough is shown in fig. 128. It is similar in principle to the preceding, but more easily cleaned; and the slats admit a greater number of sheep to feed at once by preventing interference. It is chiefly constructed of

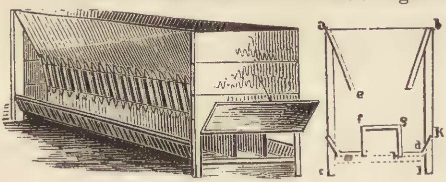


Fig. 128.

12 ft. boards, 9 inches wide. It is 4 ft. high, 34 inches wide—width of the aperture *e f*, 12 inches. Across this aperture the vertical slats are nailed, 3 inches apart in the clear, the ends being made to fit the sloping boards. The board *f g*, forming the bottom of the hopper, is 9 inches wide; and similar boards are used for the sides and bottom of the troughs on either side. The slanting sides of the hopper are nailed securely to the bevelled top of the corner posts. The lid, (seen raised,) is used to facilitate cleaning the troughs. This is the kind of feeding trough used by Wm. Chamberlain, Esq., of Red Hook, well known for his successful breeding of sheep—and is, perhaps, constructed larger than is needed for sheep of ordinary size.

A simpler and lighter trough or rack, and one better adapted to common farming, is represented by fig. 129. It consists of four scantling posts, about 3 feet long, (which should stand on flat stones,) into which the horizontal rails are let or mortised, so that the face of the rail

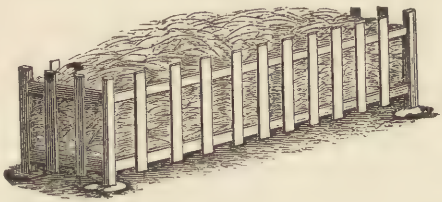


Fig. 129.

shall be one inch within the outer side of the posts. Strips 3 or 4 inches wide are then nailed on, and should be far enough apart to admit freely the head of the largest sheep; and as animals vary in size, each farmer should first ascertain by measurement before constructing his racks, the proper size. Six inches will be a proper distance in most cases.

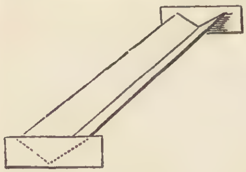


Fig. 130.

The advantages of this rack, are its lightness; facility of construction or

cheapness; compactness, rendering it easily packed away; it may be used for making sheep pens; and does not allow the hay seed to enter the wool as is the case with all open racks inclining outwards. The only disadvantage is the want of a feeding trough; but for ordinary purposes, these troughs are most convenient and most easily cleaned if made separately, as shown by fig. 130.

IMPLEMENTS FOR TILLAGE.

The simplest plow is the crooked limb of a tree, and the simplest harrow a mass of brush. The former is found at the present day only among the more degraded nations; the latter is sometimes used by good farmers with great advantage, in giving a slight covering to freshly sown grass seed. Improvements are made on the crooked-limb plow in the implement now used in Morocco, (fig. 131,) and in the more imperfect ones employed in Northern India, (figs. 132 and 133,) known as the Punjab and Kooloo plows. In the less improved portions of Germany, the Baden plow (fig. 134,) is not much inferior to the Bull plow of sixty years ago. A finished modern cast plow, in its different forms and patents, is immeasurably superior. (Fig. 135.)

Fig. 131—Moorish Plow.

Fig. 132—Punjab Plow.

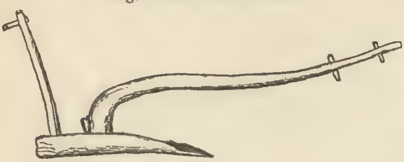


Fig. 133—Kooloo Plow.

Nothing marks the improvement of the agriculture of the present day more strikingly and distinctly than the variety and perfection of implements for tillage. The soil is now completely under our control, and we can invert and pulverize it from a mere surface brushing to almost any desired depth. A common roller will cover grass seed on mellow soil one-fourth of an inch in depth; an evenly constructed brush harrow will per-

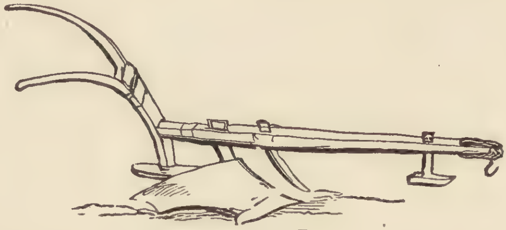


Fig. 134—Baden Plow.

form the same work half an inch deep; a fine harrow with numerous teeth will stir, pulverize, and turn up the earth one or two inches; and a coarser harrow, four inches. *Shares'* new *coulter-harrow* will invert and pulverize more than twice the depth of a common harrow; the gang-plow stands midway between Shares' harrow and the common plow. The latter

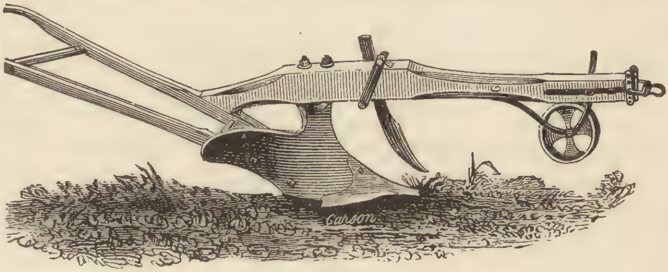


Fig.. 135—Chase's Plow.

will run down from five to ten inches or more; the Michigan or double-mouldboard plow, from ten to thirteen inches; and a good subsoil plow will loosen the earth fifteen to eighteen inches deep, measuring from the land or hard side. A more particular notice of some of these implements will doubtless be acceptable to the readers of the Register.

The *brush harrow*, for covering grass seed, as often made, is a very poor implement. The most projecting limbs are cut partly off, that all may lie flat, but it often happens that the projecting angles of the larger branches plow into the ground and make deep furrows. This may be prevented by a careful selection of the small tree which forms the brush, or by constructing a simple rough plank frame, so that any quantity of short brush may be placed between two pieces of plank, to admit the tops of the brush to incline downwards and backwards, being held in place by a few spikes or bolts. Fig. 136.

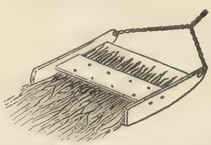


Fig. 136—Brush Harrow.

Next to the brush harrow, for pulverizing finely a shallow portion of the surface, is the fine-tooth *square harrow*, fig. 137. It should for this

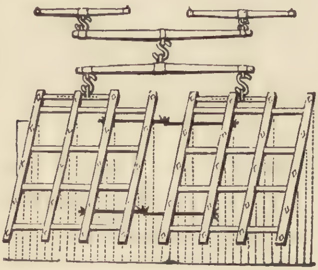


Fig. 137—Scotch Harrow.

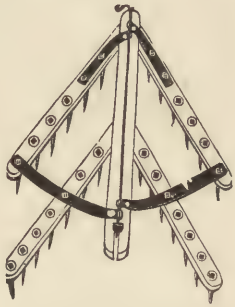


Fig. 138—Geddes Harrow.

purpose be made of tough and sound timber sawed two inches square, (the best elm answers well,) and the teeth should be about five-eights of an inch square, and they should not be less than 48 in number. Such a harrow as this will leave a plowed field nearly as smooth as an onion-bed.

For common purposes, the square harrow with larger and fewer teeth, (32 is a common number,) or the Geddes harrow (fig. 138,) answers a good purpose.

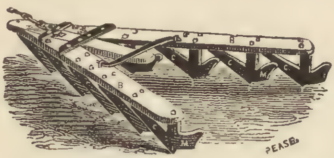


Fig. 139—Shares' Harrow.

Next, for depth, is *Shares' Harrow*—(Fig. 139.) This is the most perfect of all implements for pulverizing the freshly inverted surface of sward land, to a depth two or three times as great as the common harrow can effect. The teeth being sharp, flat blades, cut with great efficiency; and as they slope like a sled-runner, they pass over the sod, and instead of tearing it up like the common harrow or gang-plow, they tend to keep it down and in its place, while the upper surface of the sod is sliced up and torn into a fine mellow soil. No person who prepares sod for corn should be without this efficient pulverizer.

The *gang-plow* cuts deeper and more efficiently than Shares' harrow, but it does not succeed so well on inverted sod, which it tears up, unless previously well reduced by the former. The gang-plow is a useful and efficient implement for covering spring sown grain, on land plowed the previous autumn. It will also serve an excellent purpose in turning under a coating of fine manure which it is desired to keep near the surface, and not to bury too deep for the benefit of shallow rooted plants. One of the best, most perfectly regulated and most durable gang-plows is Hildreth's, which is wholly of iron except the tongue or pole. It is figured in the last number of the Register. To describe the different modifications of

the common cast plow, and point out fully their peculiar merits would require a volume for the descriptions and a life-time to prepare them. The steel mouldboard plow, although more expensive, is the most perfect implement of the plow kind.

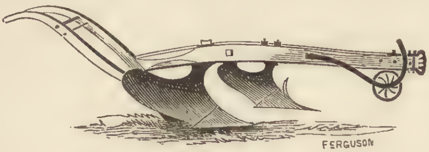


Fig. 140—Michigan Plow.

The *Michigan*, or *double mould-board plow*, (fig. 140,) is a valuable implement. It differs essentially from the subsoil plow in bringing the soil from the bottom of the furrow up to the surface. It is always useful where there is a fertile subsoil; and where there is not, it is adapted to the gradual deepening of the cultivated stratum in connection with the working in of manures. A common subsoil plow will not turn under manure. For inverting sod, so as to give a new mellow surface, nothing is equal to the Michigan plow. The annexed figures show the differenee between its results and those of the common plow. Fig. 141 shows the manner in which the common plow inverts sod—the darker portion representing the top soil, and the lighter, with horizontal lines, the subsoil. Fig. 142 shows the work of the Michigan plow, the top sod being first laid in the bottom of the previous furrow by the forward mouldboard, and the subsoil piled up in a mellow bed on the top of this inverted sod. The force required to draw this plow is about the same as for a common plow running the same depth. Two good horses with a common plow, will work to a depth of five or six inches, and three horses seven to nine inches. With the Michigan plow, three good horses will run a furrow nine inches deep, the least depth to which it will work advantageously. Four horses will do but little more, as the draught of the forward pair is partly lost by their horizontal direction of draught. The largest size Michigan plow will cut a furrow through sod twelve inches in depth from the turf to the bottom of the furrow, and twenty inches if the measurement is made from the top of the newly formed bed of mellow earth. For such a depth we have found three yoke of oxen, or their equivalent in horses, not too much.


Fig. 141—Sod Inverted by Common Plow.

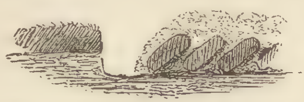


Fig. 142—Sod Inverted by Michigan Plow.

The *subsoil plow* loosens the subsoil in the bottom of the furrow, but unlike the Michigan, does not throw it up to the surface. It must always work in connection with the common plow. The results of the

Fig. 143—Sod Inverted in connection with Subsoiling.

two are shown in fig. 143, the surface or sod on the top and the loosened subsoil beneath. This is an important advantage where the under soil is sterile, and where it is desirable to deepen the fertile bed at the top by manuring, gradually. In connection with draining, it serves materially to prevent flooding as well as drought, by affording a deep spongy reservoir for the absorption of the surplus water of rains, and for retaining it till times of severe drought.

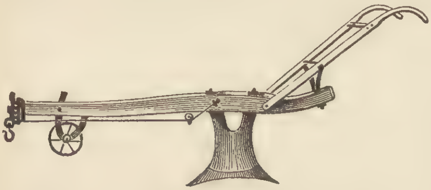


Fig. 144—Subsoil Plow.

A good subsoil plow is shown in the accompanying figure (fig. 144,) and is the kind manufactured by Holmes & Stringer, of Munnsville, N. Y. When the cast blade and point become worn, they may both be reversed, and then wear as much longer. This plow works admirably except where the land is quite stony. We have used it in the bottom of a nine inch furrow plowed by three horses, the subsoiler being drawn by two horses, and running down seven inches more, making sixteen inches in all, or over twenty inches if measured from the top of the inverted sod.

When the ground is quite stony, the ditching plow, described below, has proved the best subsoiler.

DITCHING PLOWS.

In most localities where tile drains are made, two-thirds of the labor of cutting is loosening the earth with the pick, before shoveling it out. By means of the ditching plow this laborious process is performed by horses. One span, with a good plow made for this purpose, will loosen the subsoil fast enough for eight or ten men shoveling, and cutting about 100 rods 3 ft. deep in a day; or an hour or two each day with the plow will keep two men at work. If the subsoil is very hard, this work should be done early in summer. The implement is drawn by two horses, attached to the ends of a main whipple-tree about seven feet long, one walking on each side of the ditch. From one to three times passing will loosen the subsoil five to eight inches, which is then thrown out by narrow-shovels, on both sides, so that it may be easily returned after the tile is laid, by means of a common plow drawn as before by the long whipple-tree.

There are several modifications of the ditching plow, all accomplishing the same end. Fig. 145, is one of the simplest in principle. The coul-

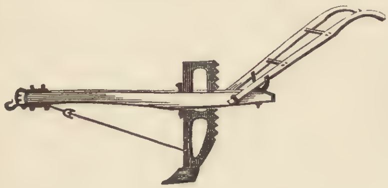


Fig. 145—Ditching Plow with Sliding Coulter.

ter is of cast iron, and is made to slide down through the beam as the ditch becomes deeper. The rear of this coulter being notched, the wedge in front secures it firmly at any depth it may be placed. A rod connecting it with the beam near the clevis serves to stiffen it—this rod is lengthened by means of a screw as the coulter descends. The chief disadvantage in the use of this plow is the want of a wheel to steady it and keep it at a uniform depth where the earth varies in softness; but where the hardpan is of uniform quality, and especially if stratified, it works well.

Fig. 146—Pratt's Ditching Plow.

Fig. 146 is *Pratt's plow.* The beam consists of two slightly curved pieces screwed together, and spreading apart at the forward end where the draught-arc is attached. By placing the draught-hook at different heights on this arc, the depth of the plow is varied. The handles are raised or depressed by passing the bolt which holds them through the different holes in the rear of the broad, double beam.

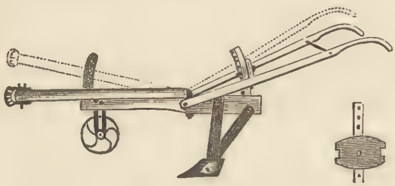


Fig. 147—Adjustable Ditching Plow.

The adjustable ditching plow, fig. 147, admits of so great a change in the height of the beam and handles, that it may be run down in the bottom of a ditch to a depth of four feet. It is perhaps the best implement of the kind for all purposes and soils. The movable portion of the beam is attached to the fixed beam by a stout loop and staple, and rises on a cast iron arc which passes through it, as shown by the dotted lines. The handles rise on a stiff *wooden* arc, (as the dotted lines exhibit,) a piece of thick plank, shown in the small figure on the right, being placed between the handles and fastened to them, to render them more firm and steady. The iron work, although light, is braced so as to impart great strength and security. The point is screwed on separately, and is nearly the only part that wears by use.

A modification of this plow rendering it simpler, and capable of run-

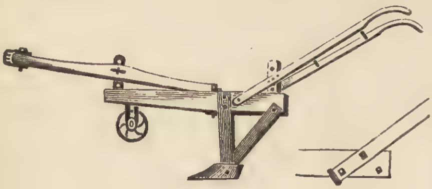


Fig. 148.

ning down to a depth of three feet, is shown in fig. 148. Instead of arcs, small uncurved stems are used for raising and depressing the beam and handles. A slot is made in the movable beam, and three holes for different heights, in the handles. The rest is similar to fig. 147.

[NOTE.—*Pratts' Ditching Machine*, described in a former number of the REGISTER, although working well when new and in perfect order, has been found on account of its great weight and complex form, and consequent liability to derangement and breakage, to be of little or no practicable value for general purposes.]

IMPLEMENTS FOR SURFACE TILLAGE.

SAYRE & REMINGTON'S CULTIVATOR.—Among the many cultivators we have used, we have been especially pleased with those manufactured by Sayre & Remington, Utica. They all have steel teeth, in which strength and lightness are well combined. Several different forms are made, one

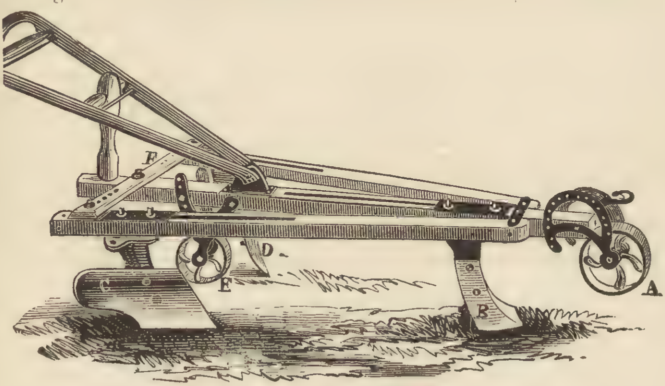


Fig. 149—SAYRE & REMINGTON'S CULTIVATOR.

of the best of which is represented by fig. 149. By means of the forward wheel A, and the central wheel E, the depth may be regulated with perfect accuracy; the sliding bars F control the width; while by reversing the blades, it may be made to throw the earth to or from the rows at pleasure. The teeth continue sharp until worn out. For corn-fields and nursery rows, we have found this implement to do twice the work of a light plow. This cultivator is also used for drilling and covering in planting potatoes,

by first placing the teeth in the form of a double mold-board plow for making the furrow—then taking out the forward tooth, reversing the others, and thus spanning the drill and covering the potatoes. If the ground is in good order, it will thus cover as fast as four men will drop.

SHARES' CULTIVATOR.—This implement (fig. 150) we have not tried, but it is well recommended for the cultivation of corn and potatoes, and all crops in rows. It is manufactured by Pease & Co., Albany.

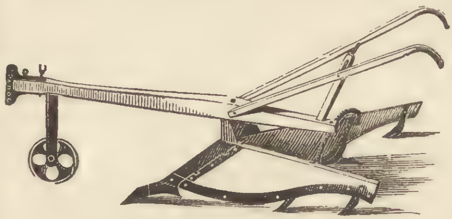


Fig. 150—SHARES' CULTIVATOR.

WETHERELL'S HORSE HOE. — This curious implement (fig. 151) is constructed on a principle quite distinct from all other implements of tillage. Small rapidly-revolving hoes, worked by the cogs on the large driving-wheel in front, scatter fine earth among the rows of corn; and if the weeds are not more than three or four inches high, they are beaten down and covered with this stream of earth, while the larger and stouter plants of the crop are not affected. From a partial trial, this implement appears to answer well, and will doubtless prove valuable where the soil is mellow and free from stones. It hills a row of corn with much neatness and accuracy. It is made by L. Wetherell, Worcester, Mass.

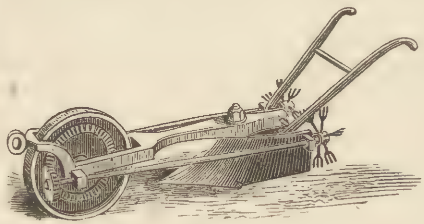


Fig. 151—WETHERELL'S HORSE-HOE.

OTHER NEW IMPLEMENTS.

In addition to the new implements already described, the following have been carefully tested and found valuable.

GLADDING'S HAY-FORK.—Every farmer who has ever pitched off from a wagon in one day ten or twelve tons of hay, is aware that no labor on the farm can be more fatiguing. The common horse-fork, which, to a considerable extent, has been brought into use, has afforded great relief; this severe work not only being avoided, but much greater expedition attained. The effective force of a horse is at least five times as great as that of a stout man; and if half an hour is usually required to unload from a wagon a ton of hay, then only six minutes would be required to accomplish the same result with horse power. Actual experiment very

nearly accords with this estimate, five to seven minutes only being required by the assistance of the best horse-fork.

The accompanying figure (fig. 152) shows the common implement, and the mode of using it. Fig. 153 is an enlarged representation of the fork.

Fig. 152.

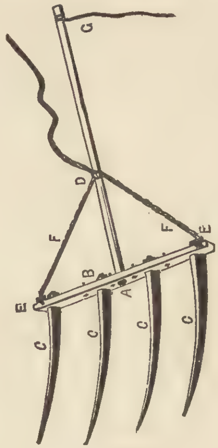


Fig. 153.

The head is about 28 inches long, and has steel prongs of 20 inches. The rope attached at D, or as it should be, rather nearer the rake, passes over the pulley above, by which the fork, after being thrust into the hay, is lifted by the strength of the horse, outside the barn-door. The fork is kept in a horizontal position, and the hay retained upon it by the cord *b*, until high enough, when this cord is slackened, and the hay accordingly deposited or dumped. The horse is backed and the operation repeated.

Fig. 154.

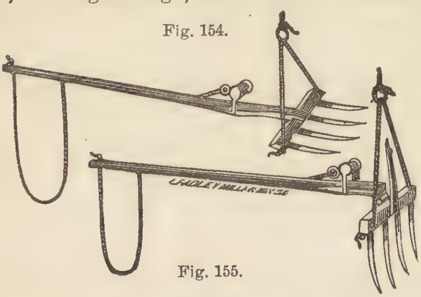


Fig. 155.

There are, however, some difficulties in the use of this fork. The most so results from the necessity for the handle of the fork to sweep upwards in a vertical position, whenever the hay is dropped from it —and falling back it is in danger of striking the operator. It is hence impossible to use it under a low roof, beyond purlin beams, or when the mow is nearly filled. To

remedy these difficulties, C. E. Gladding of Troy, Pa., has recently constructed a fork, (fig. 154, preceding page,) which, after a recent trial, we are satisfied is an important improvement. It differs from the common horse-fork by placing a hinge joint at the connection of the head with the handle; so that at any moment, by a jerk on the cord which passes up a bore in the handle, the fork is dropped as shown in fig. 155, and its load deposited. This may be done instantaneously, at the moment it happens to be swung to the most favorable spot. The fork is so hung that its weight causes the head to fly back of its own accord, and resume its former position—where it is held by an iron catch until the next forkful is to be discharged.

It should be observed, that the rope suspending the fork should be fastened to the highest portion of one of the rafters over the mow, and a smooth board should be placed vertically against the face of the mow, for the hay to slide against in its ascent. By attaching this rope in front of and within a window, the hay is carried with ease into the window, and thus lofts over sheds, carriage-houses, &c., where the common horse-fork could not be used, are filled by the use of Gladding's improvement. It may (as well as the old fork,) be also used for stacking, by making a tripod of three long poles, from which to suspend the implement.

Fig. 156—Willard's Root-Slicer.

Willard's Root-Slicer—(Fig. 156.) This has proved an efficient machine. It will cut a bushel of roots in a minute; and a half bushel if

worked quite slowly with the strength of a boy. It slices up the roots into shavings about three-fourths of an inch wide and half as thick, the principal wheel being a cast-iron plate set with small curved blades which do the work, the plate operating at the same time as a fly-wheel. It is evidently a great saver of labor, especially so to the animals which have to do the chewing.

JOICE'S STAR MILL—(Fig. 157.) This is intended solely for grinding food for animals, and is driven by two horses. According to our own experiments, it will grind a bushel of barley in five minutes; a bushel of corn in the cob in the same time; a bushel of shelled corn into coarse meal in three minutes, and into fine meal in ten minutes. It is simple in construction, has no gearing, and is very durable. To farmers remote from mill, it will prove a great convenience. It is made by Hildreth & Co., Lockport, N. Y., for about $55, and on every considerable farm will perhaps save its price each year.

Fig. 157—JOICE'S STAR MILL.

HICKOK'S STALK-CUTTER—(Fig. 158.) This is a heavy and stout machine, which may be worked by two men, but it is more particularly intended for horse power. Two horses will cut stalks, hay and straw, with great rapidity. They are cut by the shearing process, about half an inch long, and as soon as cut the small chips of the stalks pass between two grating rollers, and are torn to pieces, so that they are readily eaten by cattle. The hard stems of the Chinese Sugar Cane are thus rendered quite palatable.

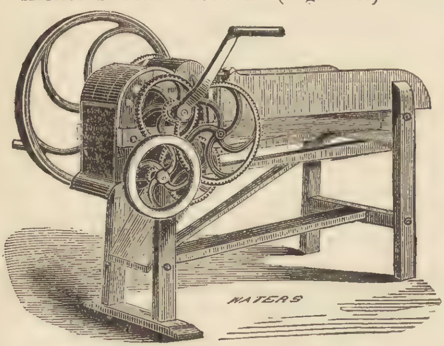


Fig. 158—HICKOK'S STALK-CUTTER.

ALLEN'S POTATO DIGGER.—Digging potatoes by hand is a most laborious task. We are glad to find the attention of inventors turned to some means of doing it by horse labor. We have recently made a trial of the potato-digging plow manufactured by R. L. Allen of New-York, (fig. 159,) on a principle similar to that of Lawson's English potato-digger, and find

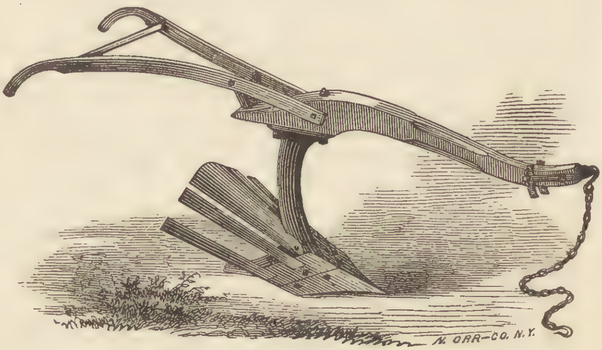


Fig. 159—Allen's Potato-Digger.

it a great saver of labor. The figure nearly explains its construction. It weighs less than a hundred pounds, and is easily drawn by two horses. There should be a driver, as the plowman needs his attention to keep it in the center of the rows. It throws a double furrow, like a shovel plow, and turns the potatoes out of the ground, throwing them on the surface with great rapidity. A very small portion remain covered, but they are easily raked out. Our trial was made on heavy and unfavorable soil, where we think it saved at least three-fourths of the labor of hand-digging. On lighter soil, we have no doubt that its operation would be still more advantageous and perfect. It works best, of course, in clean, well cultivated land, but the standard being high, it is not easily clogged with weeds or potato vines. Its depth may be accurately gauged, so as to run just beneath the potatoes.

LABOR BY HORSE POWER.

The performance of all the hard labor of the farm by horse power, so far as can be accomplished, is becoming more and more an object with good managers. A great improvement has been made in the various implements for inverting and pulverizing the soil and tilling crops; it is equally desirable that machinery for stationary labor be successfully brought into use. Some of the best farmers have already made good progress by the adoption of horse power, not only in threshing and cleaning grain, but in cutting straw and stalks, sawing wood, churning, grinding feed, turning grindstone, and pumping water for cattle.

The two-horse endless chain or tread powers, are found to be convenient for the application of labor to these several purposes. The small

space they occupy adds to their convenience. The objections to them are the unnatural position they give the horses, and their cost. These objections are obviated by the smaller sweep-powers, one of which, costing but half the tread powers, we described in the last number of the REGISTER. This power is, however, less compact, and the constant circular motion, tends in some degree to lessen the effective force. We have, however, used one with much advantage in threshing, cutting stalks with Hickok's machine, and other purposes. Many of our readers desire to know the cost of all the machinery for these different objects, and at our request, Hildreth & Charles of Lockport, who make these horse powers, and who have had much experience in their application to different purposes, have furnished the following estimate of the actual expense of such machinery:*

A Two-horse Sweep Power,	$50
Speeder or Jack for the same,	12
Threshing Machine,	30
Belt and Rod,	8
Extra Rods and Couplings,	5
Cross-cut Saw and attachments, for sawing logs,	25
Circular Saw with Table, &c., for cutting stove-wood,	35
Cap-Auger,	5
	$170

It will be seen by the preceding that the entire apparatus for threshing is $100; for cross-cutting wood, including horse power, saw, pitman, crank, balance-wheel and rods, $75; and for cutting wood by circular saw, including belts, speeder, rods, &c., about $105—when each of these is used separately.

FRUITS AND FRUIT CULTURE.

PLANT APPLE ORCHARDS.

If any farmer who has had for 20 years a good orchard of grafted apple trees, properly selected for market, and in tolerably favorable portions of the country, has kept an account of the annual *average* product of his trees in that time, he will find they have *netted* him fifty dollars per acre a year. This remark applies to such orchards as have had no care. Those which have received good cultivation have done better.

Why then cultivate whole farms, at hard labor, for a net proceed of five dollars per acre? Why not plant orchards? "They won't bear in an age?" That is because, then, they receive no care. Give them the same chance that a crop of potatoes receives, (and which would not cost a tenth of the labor expended yearly on the potatoes,) and they will send

* And which we understand are prices at which they will agree to furnish every article here mentioned.

out shoots two or three feet long—but if neglected and weed-grown and grass-bound, they will grow only two or three inches—in one instance twelve times as fast as in the other. No wonder, then, while the thrifty orchardist with his thrifty orchard, has fine young trees with remunerating crops in five years, the slip-shod cultivator does not attain the same in fifty years, at the above estimated rates of growth. These rates are stated from the result of actual experiment, and not from hap-hazard estimates.

Plant orchards, then, of the best varieties. Occasionally, it is true, there may be destitute years, and sometimes the crop at large may overstock the common market. But the above yearly average may be attained at least, in the course of seasons; and the cultivator who is known by his skill to have none but the best fruits, and made better than that of his neighbors by superior cultivation, will be eagerly sought by fruit buyers, even in the most abundant seasons, and if he ships his own apples, he may often obtain triple prices for his handsome and excellent specimens.

TRANSPLANTING SMALL TREES.

It has been a very general, almost universal desire among tree-planters, to have large-sized trees from the nursery. One person about to set out an orchard, wrote, "Send me *man* trees. I do not want puny little children—but large, full-grown specimens." Another said, "I want the largest trees you have—I don't care much what kind they are—but give me tall ones—if a rod high, all the better." "But," the nurseryman replied, "smaller ones will be better in five years than these." "I don't care, I want big ones; I may not live five years, and I want fruit *now*." Three or four years after, the same planter called again. Without waiting for an inquiry, the nurseryman immediately remarked, "Well, I have some fine large trees which I can furnish." "Don't want 'em! don't want 'em!" was the answer, "I've had enough of large trees—they have cost me ten times as much labor to set out as the small ones I took from necessity. They have not grown one inch; are just the same size I bought them, although I have doctored them and nursed them, and they have borne me only a very few of half-grown worthless fruit. The small trees have already outstripped them, and have begun to bear large, excellent specimens."

These experiments have now become so numerous, that a change in the opinion of planters has generally taken place, in relation to the size of trees. Where 12 feet were formerly demanded as a desirable height, 5 or 6 feet are now quite as satisfactory, and some find still smaller ones to do better. At a meeting of the Fruit-Growers' Society of Western New-York, held at Rochester a year ago, this subject was fully discussed, and none, who had ever tried the experiment, with large and small trees side by side, could be found who preferred the former. Many instances

were related, and in every case without exception, (good culture being given,) the small trees soon out-grew the others, and were not only larger, but incomparably more vigorous and thrifty. Two-year apple trees and one-year peach trees were preferred by some of the best cultivators present, to any of larger dimensions. And in addition to these advantages, the smaller trees are almost sure to survive transplanting, with scarcely a loss of one in a thousand; while the extra large ones, the roots of which must be greatly mutilated in removal, die by scores. The labor of digging up the large trees, the cost of transportation on them, and the cost of resetting them, are all several times greater than with smaller ones. Where they are to be sent some distance by railroad, the increased cost of conveyance, as well as in risk and in packing, is greater than a hasty observer can have any idea of. A tree, for example, which is twice the height and diameter of another, is greater in weight in a cubic ratio. If a hundred of the smaller weigh two hundred pounds, one hundred of the larger will weigh eight hundred pounds, or nearly half a ton —the cube of two being eight. A single season's growth will often make this difference in the nursery—but many years, after being checked by removal when large. There seems, indeed, to be every reason why trees should be removed small, and everything against the practice of leaving the work till they attain large size. Sir Joshua Reynolds said if he were to paint a picture of Folly, it would be by representing a boy climbing over a high wall with an open gate close at his side. Had he lived now, he might do it with equal effect, by representing a purchaser selecting large trees at a nursery, and rejecting the young thrifty ones.

There is only one instance in which the larger trees can have any advantage, or can maintain it for two or three years—and this is where both large and small are treated with total neglect after setting out, so as barely to survive and not to grow at all. Both remaining stationary, the larger ones will of course maintain their superiority. But all good cultivators discard such treatment.

The practice of copying English customs, has in this case had an especially pernicious effect. In Britain, the moist climate favors the removal of larger trees than can be safely transplanted here. The experiments of Sir Henry Stewart in Scotland, in manufacturing a park of trees to order, thirty or forty feet high, and the publication of a work giving the details of his experiment, have done a great deal of harm. The park, after the first year or two, presented a very shabby, thriftless, and stunted appearance; but even while this practice was at the height of its popularity, that far-seeing and skillful culturist, J. C. Loudon, asserted that with five years' time and with deeply-trenched land, he would agree to produce a finer effect with small trees, subjected to the best treatment, than any that could possibly be accomplished by the removal of large ones at the same time.

APPLES FOR MARKET.

The following condensed report of the discussions on this subject at the last winter meeting of the Fruit-Growers' Society of Western New-York, contains many interesting suggestions to planters:

The committee on business reported as a subject for discussion, the number of varieties and their names, for an orchard of a thousand trees. L. B. Langworthy said that simply for profitable marketing, he would make a very short list—he would plant only two sorts—the Fall Pippin and the Baldwin. A member objected to the Fall Pippin on account of its poor bearing, but proposed the Tompkins County King in addition to the Baldwin. Another member urged the importance of a larger number of varieties, in order to secure a more certain supply in different seasons, as particular sorts failed in certain seasons. H. E. Hooker of Rochester proposed to add to the Baldwin, Rhode-Island Greening and King, the Roxbury Russet, the latter being the most reliable apple for late spring. Luther Barber of Bloomfield, had found the King rather unproductive—the Baldwin producing several times more, both on young and old trees. A. Stone of Oswego county, would add the Lowell, a mid-autumn variety, and the Wagener, an early bearer, and a very productive and very good sort. G. Ellwanger added Red Astrachan and Sweet Bough. T. G. Yeomans of Walworth, reminded the Society that nearly every person, who had but very few trees, usually had a full supply of early sorts, and did not expect to buy of these, but that winter apples were chiefly wanted by all. He preferred the Baldwin to all others, for its growth, productiveness, and fine appearance. He would therefore propose for the orchard of a thousand trees, nine hundred and ninety-nine Baldwins, and perhaps the remaining one would be a Rhode-Island Greening. B. Fish of Rochester, would have at least ten sorts, because as the community is made up of families, he would have such sorts as families want for their own use, namely, an assortment of different kinds.

W. B. Smith of Syracuse, would not be so liberal in his list as his friend Yeomans, but would for an orchard of 1000 trees, set out 1000 Baldwins. P. Barry thought that the profits of a large orchard would depend almost wholly on winter kinds, that could be sent to the large cities in large quantities; that summer sorts are usually brought in small quantities by farmers generally, who have a few bushels to spare, and that the market is mostly supplied in this way. He would plant mainly of three sorts—the Rhode-Island Greening, Baldwin, and Roxbury Russet, not perhaps in quite equal quantities—he would prefer the Greening to all others, and although the Baldwin was extremely popular from its early bearing, he thought it not always best to allow trees to bear so young. H. N. Langworthy said a greater number should be recommended, for if only a few were generally planted, purchasers would soon "get sick" of a supply so deficient in variety. The President (B. Hodge)

stated that after much experiment, he was now planting out Baldwin and Rhode-Island Greening. The *Northern Spy* was mentioned, and had its friends and opposers. L. B. Langworthy thought it was time it was "knocked in the head"—others objected to it on account of its want of early bearing, but admitted its excellence. T. G. Yeomans stated that he had filled a barrel with 219 specimens, and several cases were mentioned of its productiveness. The fact was also stated that in some portions of the north-western States it had proved valuable, and the California Horticultural Society had pronounced it the most valuable sort out of many that had been fruited in that State, all things considered. P. Barry said that he regarded this apple the finest in quality of any sort grown; that it was objected to because cultivators in this country were so extremely impatient, and must have trees bear immediately. Another objection was in consequence of its delicacy, rendering it easily bruised if carelessly conveyed to market. He had seen several barrels of it at the west, however, that with care had been conveyed there with perfect success, and the specimens were so fine that the owner said it would require several days for him even to *fix a price on them!* L. Barber of Bloomfield, the place of its origin, said it would not do to recommend it for general cultivation, because, needing good, rich, mellow soil, planters generally would fail from the neglect it would be sure to meet with. S. H. Ainsworth, for the purpose of making the most money at the present day, would plant only the Baldwin—but looking farther ahead, he would also add Rhode-Island Greening, Tompkins County King, Twenty Ounce, and Roxbury Russet. He would also plant Northern Spy. He mentioned the twenty-two trees of the Spy owned by R. J. Hand, that some years ago bore four hundred dollars worth of apples, from high cultivation. He would recommend it, however, to only such cultivators as would cultivate well, thin out the top, and pick off the poor specimens, so that they will not be crowded. He had seen the orchards of some persons who had denounced this apple, but their trees were neglected, and the tops as thick as a hedge fence. He highly commended the Sweet Bough, as a sort that would continue to ripen from summer nearly through autumn.

At the same meeting, the following result of the votes of seventeen of the most intelligent and practical members, will show the reputation of different varieties for market in Western New-York—each member making a list for an orchard of 1000 trees. Of the 17,000 thus voted for, there were

6,800	for the	Baldwin,	100	for the	Red Astrachan,
3,200	"	Rhode-Island Greening,	100	"	Lady Apple,
1,600	"	Roxbury Russet,	100	"	Wagener,
1,325	"	Tompkins Co. King,	100	"	Sweet Bough,
850	"	Northern Spy,	50	"	Duchess of Oldenburgh,
850	"	Twenty Ounce,	50	"	Swaar,
475	"	Tallman Sweeting,	50	"	Cooper's Market, (local,)
300	"	Fall Pippin,	50	"	Keswick Codlin,
300	"	Esopus Spitzenburgh,	25	"	Peck's Pleasant,
150	"	Lowell,	25	"	William's Favorite.
100	"	Golden Russet,			

THE BALDWIN APPLE.

For *early* productiveness, perhaps no apple is equal to the Baldwin. This quality renders it eminently popular among our impatient Yankee fruit-raisers. The adverse quality in the Northern Spy renders the latter eminently unpopular. The character of the Baldwin is thus raised higher than its real merits; that of the Spy is depressed lower.

We have had Baldwin trees bear a bushel or more the fifth year from transplanting, and over three bushels the seventh. B. Hodge of Buffalo, mentioned that in 1848 he sold a farmer 100 apple trees of Baldwins and Rhode-Island Greenings. In 1855, eight years afterwards, the orchard having received good cultivation, they yielded 120 barrels of apples, many of the Baldwins bearing three barrels each. S. H. Ainsworth of West Bloomfield, N. Y., recently informed us that one of his neighbors re-grafted an old orchard to the Baldwin. There were forty trees, covering about an acre of ground. In six years, he sold the crop of those forty trees for *three hundred and fifty dollars.* A. Loomis of Batavia, N. Y., says that his brother had a tree of the Baldwin that bore twelve barrels of good marketable fruit, (besides four or five bushels of windfalls;) and that he sold the twelve barrels for $2.25 per barrel, or *twenty-seven* dollars for the tree. Forty such trees would be one thousand and eighty dollars. It does not succeed at the South and West. The Northern Spy has done well in Wisconsin and in California.

APPLES FOR VIRGINIA.

The best sorts are Carolina Red June, Gravenstein, Belmont, Fall Pippin, Bellflower, Smokehouse, Smith's Cider, Male Carle, Maiden's Blush, Loudon Pippin, Limbertwig, Fallawater, Rambo, Prior's Red.

VALUE OF THE FRUIT CROP IN MASSACHUSETTS.

Marshall P. Wilder states that the value of the fruit crop in 1845, was $700,000—in 1855 it was $1,300,000—now it cannot be less than $2,000,000. The pear crop in Massachusetts is valued at $100,000 per annum.

SELECT FRUITS FOR NEW-ENGLAND.

M. P. Wilder, President of the American Pomological Society, furnishes the following select list of fruits:

The following were recommended as the *six* best varieties of apples: The Williams, Early Bough, Gravenstein, Fameuse, Hubbardston Nonsuch, and the Baldwin; and if *twelve* varieties were desired, the Red Astrachan, Rhode-Island Greening, Ladies' Sweet, Porter and Tallman Sweeting might be added.

For pears on their own roots, the following were recommended:

Best six pears on their own roots.—Bartlett, Urbaniste, Vicar of Winkfield, Buffum, Beurre d'Anjou and Lawrence.

For the best twelve add—Rostiezer, Merriam, Doyenne Boussock Belle Lucrative, Flemish Beauty and Onondaga.

Best six on quince roots.—Louise Bonne de Jersey, Urbaniste, Duchess d'Angouleme, Vicar of Winkfield, Beurre d'Anjou, and Glout Morceau.

FRUITS FOR WISCONSIN.

The following list of fruits for a family supply is given in answer to a western correspondent. It is difficult to give a precise list, as it may be that the crop will be ten times as great in some years as others; and again some will bear abundantly and others fail in the same season. The following, however, will serve as an attempt or approximation:

EARLY SUMMER.—Early Scarlet, Wilson's Albany, and Hooker *strawberries*—two or three square rods, well cultivated in drills.

EARLY AND MID-SUMMER AND LATER.—Red and White Dutch currant, Cherry, White Grape, and May's Victoria, one to two dozen bushes each; two dozen Houghton's gooseberry; Fastolff and Franconia raspberries, one dozen or more each, and three dozen Brinckle's Orange, all to be laid down in winter; three trees Mayduke cherry, three of Early Richmond, one of Belle de Choisy, and four of Belle Magnifique; a dozen each of Dorchester and Rochelle blackberries.

LATE SUMMER.—Red Astrachan, Sops of Wine, Carolina Red June, High-top Sweeting, Early Joe, Benoni, Sweet June *apples*, each two trees; Tyson, Rostiezer, Osband, and Brandywine pears, each two trees. Some currants and blackberries will continue till this time.

AUTUMN.—Oldenburgh, Late Strawberry, Fall Orange, Dyer, Gabriel, Maiden's Blush, and St. Lawrence apples, each three trees; Flemish Beauty, Buffum, Fulton, Onondaga, and Stevens' Genesee, each two trees; the two first being very hardy, might be planted in greater numbers. If *dwarfs* are desired, for coming soon into bearing, they may be of the following sorts, which are among the hardiest at the west, and which do well as dwarfs: Buffum, Osband's Summer, Oswego Beurre, Tyson, White Doyenne—and Glout Morceau and Easter Beurre for winter—three to six each—more of the two last. The Delaware, Clinton, and York Madeira grapes—two to six vines each—the Delaware is the most valuable.

WINTER AND SPRING.—*Westfield Seeknofurther*, Jonathan, Fameuse, *Yellow Bellflower*, Winesap, *White Winter Pearmain*, and Mother apples, each five, except those in italics, of which there may be ten each.

Those living at the west, who may be well acquainted with those fruits which do best there, may add to or modify the list.

FAILURE OF WESTERN FRUIT TREES.

Lewis Ellsworth, one of the most successful and intelligent fruit-growers in Illinois, says in a communication to the Prairie Farmer, that the loss in fruit trees in that State within the last three years, is *millions of dollars*—that it is attributed to the cold winters and dry summers. But he asserts that to a great extent, this result has arisen from their standing *unprotected* in a soil underlaid with a retentive clayey-loam

subsoil, which characterizes most of the prairie lands. He has adopted the practice of ridging his land, by repeated plowings, commencing at the same ridges and ending at the same dead furrows, and where nursery trees were formerly thrown out by freezing, since ridging they stand throughout the winter without injury, and make a better growth in summer. He recommends the ridging system for all orchards, each row of trees being placed on the center of the ridge.

We have no doubt that draining would lessen the effects of severe winters on fruit trees in other regions than the west.

RIPENING PEARS.

At the winter meeting of the Fruit-Growers' Society at Rochester, in 1859, the remarks on this subject were confined to the *Glout Morceau* and *Vicar of Winkfield.* P. Barry said the crop of the former always improved after a few years of bearing. The specimens first grown on young trees were difficult to mature well, but as soon as the trees beeame large enough to yield a bushel or barrel, they ripened well. A diversity of opinion was expressed in relation to the *Winkfield.* W. R. Coppock of Buffalo, had been very successful with this fruit when placed in a warm room, the temperature of which had been kept up to about 90 degrees, and their quality had proved of a high character, and they had sold readily in market for six dollars per bushel. H. E. Hooker of Rochester, had, on the contrary, found no necessity for a warm temperature, but had ripened them perfectly in the barrel in the cool cellar. B. Fish had succeeded equally well in a cold upper room, the maturity in which was perfect, and their quality excellent. But he considered it of the utmost importance, (and others agreed with him,) that the pears should be *well grown* from well cultivated trees. S. H. Ainsworth of West Bloomfield, had combined the two modes, keeping the fruit in a cool cellar, and placing them in a warm room about ten days before needed for eating. He had been agreeably disappointed in the quality of this variety, as it had not only ripened as well as the Virgalieu, but had proved scarcely inferior to it in quality.

PEARS FOR MARKET.

At the same meeting, W. R. Coppock of Buffalo, would set out in an orchard of 1000 trees, 500 Bartletts on pear stock, and 500 Winkfields on quince. J. J. Thomas would confine his list to Angouleme and Louise Bonne Jersey, (on quince,) and Bartlett, Flemish Beauty, Sheldon, Seckel, and Lawrence on pear. P. Barry would add to these the Beurre d'Anjou, and the Winkfield and Easter Beurre on quince. Others recommended the Virgalieu or Doyenne as best of all where it did not crack.

HARDY PEAR TREES.

Some of the best and most productive pear trees in the Eastern and Middle States, prove tender at the west during severe winters. Among

these may be mentioned the Bartlett, Madeleine, and Belle Lucrative, for pear stocks, and the Angouleme and Louise Bonne of Jersey on quince. The following varieties have generally proved hardier in western localities: *On pear stock*—Flemish Beauty, Lawrence, Tyson, Buffum, Fulton, Osband's Summer, Onondaga, Sheldon. *On quince*—Stevens' Genesee, Buffum, Flemish Beauty (double worked,) and Urbaniste.

SELECT LIST OF THE NEWER PEARS.

At the request of the writer, P. Barry and G. Ellwanger of the celebrated Mount Hope Nurseries, Rochester, N. Y., have kindly furnished the following lists of the best of the newer pears. No fruit-growers in America have more extensive specimen grounds, or have been more successful in testing and sifting out from the vast multitude of new sorts, those likely to prove the most valuable. Each has furnished a separate list without consultation with the other, with the following result, in which, it will be perceived, they have coincided remarkably:

LIST OF P. BARRY.—*Three best:* Beurre d'Anjou, Beurre Superfin, Sheldon. For *six best*, add to the above: Beurre Hardy, Beurre Clairgeau, and Howell. For *twelve best*, add to the above: Brandywine, Beurre Giffard, Beurre Langelier, Nouveau Poiteau, Rostiezer, and Doyenne d'Alençon.

The list furnished by G. Ellwanger, agrees exactly with the above for the *three best*, and also for the *six best*. The six added to make out the *twelve best*, agree with the exception of Beurre de Waterloo and Beurre gris d'Hiver Nouveau, substituted for Rostiezer and Doyenne d'Alençon.

In relation to the value of the above mentioned new sorts, P. Barry remarks: "As to the merits of these new sorts of pears named above, as compared with Bartlett, Flemish Beauty, Louise Bonne, Belle Lucrative, &c., we would only say that B. d'Anjou, B. Superfin, B. Hardy and Sheldon, are all superior in *quality* to the old ones named; but for a small collection, we would still prefer the old ones. The Louise Bonne is one of the most valuable of all, considering how hardy, productive, and sure it is, both on pear and quince. Howell, in growth, productiveness, and quality, is about a match for Flemish Beauty, but is not so showy. No one variety is so much sought for yet as the Bartlett—this is the experience of nearly all nurserymen."

The following list of new varieties has been furnished by H. E. Hooker of Rochester, one of the most careful as well as most intelligent fruit-raisers of this country. In presenting it, he remarks: "The more I test and compare good fruits, the more I become satisfied that there is no fruit designed to comprehend all the excellences; and the more years you grow the new, the more you become satisfied it will not do to discard the old sorts. * * Those named below are as new with me as I should be willing to speak of with certainty:"

Three best—Beurre Giffard, Beurre Hardy, Lawrence.

For six best, add—Doyenne d'Ete, Brandywine, Beurre St. Nicholas.

For twelve best, add to the preceding—Kirtland, Beurre d'Albert, Beurre d'Anjou, Beurre Superfin, Beurre Clairgeau, Belle Epine Dumas.

DWARF PEARS—LENGTH OF ROOTS.

A careful measurement has been made by the writer, of the roots of dwarf pear trees that had grown only two summers. They were found to be about *four feet* long—forming a circle of fibres *eight feet* in diameter, in the center of which the tree stood. To dig a circle around each tree, large enough for this extent of roots, would therefore require spading a surface at least ten feet in diameter, for the roots of weeds and grass will extend inwards towards this circle at least one foot, and often much more. As the trees grow older, the circle must be much larger. The impossibility of giving adequate cultivation by means of the small circles often seen, not more than three or four feet in diameter, is obvious. Nothing but perfect and *broadcast* cultivation of the soil will answer.

PLUM TREES FOR NORTHERN ILLINOIS.

The following list is recommended as promising well for the colder parts of the Western States, or where danger is feared from the severity of the winters: Royale Hative, Prince's Yellow Gage, Red Gage, Lombard, Bradshaw, Schenectady Catharine, Bleecker's Gage, McLaughlin, Monroe, Corse's Nota Bene, Imperial Gage, Smith's Orleans, Reine Claude de Bavay, Fellenberg, Coe's Late Red, Quackenboss, Fulton.

NEW PLUMS.

List of New Plums, by P. Barry.—*Three best:* Bradshaw, McLaughlin, Reine Claude de Bavay. *Six best*—add Rivers' Early Favorite, Fellenberg. Prune d'Agen. *Twelve best*—add Bryanston Gage, Golden Gage, Pond's Seedling, (English,) Victoria, Downton Imperatrice, Prince Englebert.

List by G. Ellwanger, made without seeing the above: *Three best*—Bradshaw, McLaughlin, Peters' Yellow Gage. *Six best*—add Rivers' Early Favorite, Prince Englebert, Pond's Seedling. *Twelve best*—add Bryanston Gage, Reine Claude de Bavay, Denniston's Red, Wangenheim, Royal Tours, Sharp's Emperor.

CULTIVATION OF THE BLACKBERRY.

The two best sorts are the Rochelle and Dorchester. The former has yielded at the rate of 100 bushels per acre. The stools should be about six or eight feet apart, and after coming into bearing should be cultivated with a horse, with no crop between. Occasional manuring should be practiced. Three or four stems are enough for each stool. Early in summer, when the stems are about four feet high, they should be pinched off at the tip, which will make them more "stocky," and the side shoots

will become stouter, and the whole better bearing plants. They may be kept in better form by tying to a stake, which should be *inclined*, so that the side branches may not break down with the weight of the fruit.

MARKET STRAWBERRIES FOR WESTERN NEW-YORK.

An interesting discussion took place at a late meeting of the Fruit-Growers' Society, in relation to the merits of several varieties. The Triomphe de Gand was very large, mostly flattish, coxcomb-shaped, and the largest measured two inches longest diameter. It needs high cultivation in "hills," and is not a great bearer. The Peabody had been cultivated by several, was large, often an inch and a-half in diameter, of excellent quality, but a moderate bearer at best. For market, the Large Early Scarlet and Wilson were most generally approved; the former for running and covering the bed; the latter for "hills." The following was the result of a vote taken, nineteen members voting for the best market sorts:

Large Early Scarlet,	19 votes.	Genesee,	4 votes.
Wilson's Albany,	19 "	Crimson Cone,	4 "
Hooker,	11 "	Cushing,	3 "
Hovey,	10 "	Scott's Seedling,	1 "
Triomphe de Gand,	8 "	Victoria,	1 "
Burr's New Pine,	6 "	Heuey's Seedling,	1 "

Amateur Sorts.—There were but 7 votes, with the following results:

Hooker,	6 votes.	Triomphe de Gand,	3 votes.
Large Early Scarlet,	5 "	Jenny Lind,	1 "
Burr's New Pine,	5 "	Scarlet Melting,	1 "
Wilson's Albany,	4 "	McAvoy's Superior,	1 "
Hovey,	3 "		

WILSON'S ALBANY STRAWBERRY.

A. Van Voast of Schenectady, states that he raised in 1859, from plants set out in 1858, on a piece of ground 9 by 15 feet, by careful measurement, 32 quarts of berries, besides about 3 quarts given away as samples. At the same rate an acre would give 322 bushels. This sort seems to have succeeded finely in the Western States, wherever tried.

GRAPES.

Numerous plantations of hardy grapes have been made within two or three years in various parts of the Northern States, for supplying the market with the fruit. A great impetus has been given to this enterprise by the large profits which a few successful cultivators have made, amounting in some cases to twelve or fifteen hundred dollars per acre. These great results have been obtained by the very highest cultivation, by which the quality and size of the fruit is so improved as to sell for more than double the price of ordinary crops, besides being earlier and better ripened. Thorough maturity has been found absolutely necessary to secure from injury by freezing, and consequently such fruit is much better for winter marketing, when the highest price may be obtained. A very large portion of the many vineyards lately set out, receive only

ordinary attention, and the crop will therefore not only disappoint the owners, but will be difficult to sell at all on account of its inferior quality, as well as the great quantity of such inferior fruit which will be thrown from all sources into the market.

Grapes will grow on a soil that will produce good corn and potatoes; but unless deeply loosened and heavily enriched, they will not be of a quality to sell well in market. The most profitable way, therefore, by all odds, is to make the soil deep and rich, and give the best cultivation and proper pruning. If the cultivator passes through the vineyard at least *fifteen times* in a single season, or once a week or oftener, as long as the vines are to grow, such thorough treatment will obviate very deep trenching. It should, however, be as deep as can be effected by the common plow, followed by a good subsoiler, and afterwards a hundred loads of good manure per acre turned in at different depths by the use of the common and double Michigan plows. The whole vineyard should be well underdrained. If set in the autumn, all the plants should be protected by a slight covering of earth during winter. A *rich soil*, whether light or heavy, will bring good grapes. Grapevines are usually set out when two years old—sometimes as old as three years.

BARK LICE ON THE APPLE TREE.

A. G. Hanford of Waukesha, Wisconsin, has been successful with a mixture of equal parts of tar and linseed oil, applied warm, *not hot*, early in spring, to the bark. This mixture does not continue soft and spread over the surface and close the pores so as to kill the tree, as grease would do; but it forms simply a *varnish*, which soon becomes hard, and when the tree appears in leaf and begins to grow, this varnish cracks and peels off, carrying the bark lice with it, and leaving the bark fresh and smooth. Dr. Fitch in his Treatise on Insects, mentions another remedy which he considers very efficacious, prepared as follows: Leaf tobacco is boiled in a strong lye until reduced to an impalpable pulp, and this is then mixed with soft soap (which has been made cold, and not boiled,) the whole mixture becoming of the consistence of thin paint; this, when applied, does not easily wash from the tree, as lye, tobacco water, &c., would alone. One application with the brush to every part, will protect trees two years. A young orchard of 150 trees, required two men a fortnight to go over every part, branch and twig, through the orchard. The trees grew thriftily, and were perfectly free from lice, while others in every direction were dying from their attacks.

Quassia, soda wash, &c., have been strongly recommended, but are much less efficient.

THE APPLE BORER.

This insect, so troublesome in many places, should be looked for early in summer and autumn. We have never found anything better than

punching them to death in their holes. The fresh sawdust-looking deposits, thrown out at the foot of the tree, are always an infallible indication that the borer is doing his work. The sooner he is destroyed the better. A flexible wire is a good tool for destruction; but a slender, half-seasoned apple shoot, answers a good purpose. The insect may be reached if five or six inches within, if he has not packed the hole too closely with his chips. As an intelligent friend quaintly remarks, "we may always know when we have killed the borer by the *squashing* at the end of the shoot." A little experience, and a moderate share of skill, are all that are required to clear a tree in a few minutes. It is always best to clear away the chips and outer bark with a knife, till the hole is distinctly found.

SENDING GRAFTS BY MAIL.

The mode of sending grafts by mail, so that, if some weeks on the way, they may arrive perfectly fresh, is becoming well understood by many. It consists in simply enclosing them in oil-silk, wrapping fine thread around so as to bring all parts into contact and making a water-tight case. One of the worst things to wrap around grafts is dry, unsized paper, which absorbs the moisture rapidly from the fresh wood.

A friend once sent us in autumn, from a long distance, some apple grafts; and as they would probably be several weeks on the road, he purposely left the leaves on as a moist casing to prevent their becoming dry. As leaves are constantly pumping out and throwing off the moisture from the shoot, the result may be easily guessed—the grafts were as dry as dead twigs when they reached us. Unwilling to lose them, however, we immediately wrapped them in moss and buried them in soil, where they remained till spring. When examined, they had become swollen, plump and fresh, and being set, all grew.

ROOT-GRAFTING THE APPLE.

Root-grafting is well understood by nurserymen; but there are many others who desire information on the subject, and especially on the expeditious performance of this operation. A grafter may work hard a whole day, and by an inconvenient arrangement of tools and materials, insert not a third as many as another grafter, who gives careful attention to all these particulars. The following method is the result of long practice, and by it we have known a skillful workman to insert three thousand grafts, with an assistant to apply the wax plasters, during ten hours in a single day, in the best manner, and three thousand five hundred, on another occasion, in eleven hours.

The tools consist, 1st, of a sharp, thin-bladed knife, of which the best is made from the blade of an old scythe, ground to its proper form on a grindstone; 2dly, a bench or table placed in front of a light window, and on which the work is done; 3dly, an apron, worn by the grafter, the two lower corners being hooked fast to two sharp nails on the near edge of

the table, for holding the scions while cutting them; 4thly, strips of waxed paper, about an inch wide, made by brushing over sheets of thin, tough paper, a melted, well-stirred mixture of four parts of rosin, two of tallow, and one of beeswax, and then cut into strips when precisely at a proper degree of coldness to separate well by means of a knife cutting upon a smooth board. A sufficient number of these for immediate use, should be hung near enough to the stove which heats the room, to keep the wax upon them about the consistence of butter on a summer day, so as to fit and adhere to the grafted root, without melting and running.

The first operation is to cut up the grafts from the shoots or scions. It is performed by holding the scion in the left hand, the thicker end point-

Fig. 160.

ing towards the right hand, which holds the knife. Such a shoot is represented of diminished size, by fig. 160, the points *a*, *a*, *a*, the places where it is cut into grafts, and the dotted lines show how the cuts are made. Fig. 161 shows a portion of the shoot the natural size; 1, the first cut nearly directly across—2, the second or sloping cut, and 3, the slit for the tongue—and the whole finished and separate in fig. 162. Three strokes of the knife are thus required to cut and prepare each graft, and a rapid and skillful operator has done one hundred and twelve in the manner described, in five minutes. Each shoot is thus cut up while yet held in the left hand, and the grafts as fast as they are severed, drop into the cavity of the apron already described. The counting is done during the process of cutting, and at no other time.

Fig. 161.

Fig. 162.

Fig. 163.

The second operation is setting these grafts into the roots. Each root is held in the left hand precisely as the scion has been—(fig. 163;) the three cuts are given it (shown by the dotted lines in fig. 164,) to prepare it for the graft (as represented in fig. 165, on the opposite page.) The grafts having been placed directly under the operator's fingers, and in the right position, each one is successively taken and firmly

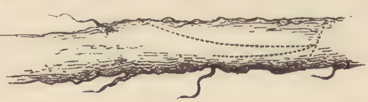


Fig. 164.

Fig. 165.

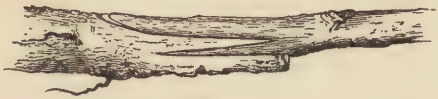


Fig. 166.

fitted to the prepared root, as shown in fig. 166, and as soon as this is done, another cut of the knife three inches lower down the root, severs it, and the root-graft is finished, and drops off obliquely on the table. Another sloping cut on the same root, and a slit for the tongue, are quickly made, and another graft picked up and inserted, the root being held all the while in the left hand, until worked up. The great point is to perform much with little handling. A single root will sometimes make but one graft, but more commonly two or three, and sometimes more. Each portion of root shoald be about three inches long, and the graft about five inches.

Root-grafting may be performed at any time during winter, and those who have much of it to do, often continue the process the winter through. The roots when taken up in autumn, should be well washed, the tops cut off, and the roots packed in boxes with alternate layers of damp moss. Thrifty one-year roots are better and more easily worked than two-year roots. Side roots, or branches, should never be used. The scions may be kept in the same way. This is better than packing them in sand, which imparts a grit to them and dulls the knife. Different modes are adopted for packing away the grafts. The best is to place them flat in boxes, in alternate layers with sand, like miniature cord-wood, keeping the outer or graft-ends very even, and carrying up each layer separately and one at a time, so that one may be taken out for setting out without interfering with the next succeeding pile. The sand should be slightly moist and not wet. The varieties should be distinctly marked on strips of board separating each kind, where there is more than one in a box, and in addition to this, a card should be nailed on the outside, naming the kinds, at the point of separation between them. A record should also be made as they are deposited, of the sorts, their order, and the number of each. Boxes two feet long, a foot wide, and six inches deep, are a convenient size, and will hold from one to two thousand each. If furnished with bow handles, they are easily carried at once to the field for setting out. Boxes holding 20,000 or more, keep the grafts equally well, but require additional labor in unpacking when set.

They should be set out in spring as soon as the soil is sufficiently dry, and there is no further danger of its freezing severely. Special pains should be taken to pack the earth well about them, as they are dibbled in. The tips of the grafts should project about half an inch above the surface. The proper depth of setting is controlled somewhat by circum-

stances; if deep, the soil may be too cold to start them well; if not deep enough, the drought of summer may destroy them. The old practice of setting them upright in boxes, to start into leaf before planting, is now discarded. An active hand will set two or three thousand in a day, and in rare instances five thousand.

Apple trees may be propagated by root-grafting with half the labor required to raise trees by budding; and except in the severe winters of the north-west regions of the Union, where root-grafted trees are apt to be injured by the freezing and thawing at the surface, they are as good as when propagated in any other way, according to many careful and frequently repeated experiments.

NURSERIES IN THE UNITED STATES.

SUPPLEMENT TO LAST YEAR'S LIST.

INQUIRIES having been sent to the different nurserymen in the United States, for corrections and additions, the following returns have been received. We have also discovered in last year's list a few exaggerations as to the extent of the grounds actually occupied with trees—these will be carefully corrected in the *complete list* to be published next year; and in the mean time we earnestly request every nurseryman to give us all the information necessary early next summer, of others as well as their own nurseries. Those who fail to do so, cannot properly complain of omission. As some have hesitated to furnish facts in relation to other nurseries, it is perhaps hardly necessary to state that the names of all such contributors of facts will be held strictly confidential, more particularly as it relates to the *extent* of nurseries, which we are especially desirous to receive.

MAINE.

J. W. Adams, Portland, has increased his nursery, and added 2,000 feet glass structures.

MASSACHUSETTS.

Eliphalet Stone, Dedham, 10 acres.

CONNECTICUT.

N. H. Lindley, 2 ms. north of Bridgeport.

NEW-YORK.

J. W. Bailey, Plattsburgh, 20 acres.
C. P. Bissell & Salter, Rochester—35 acres, mostly grapes and small fruits.
Ellwanger & Barry, Rochester, have increased their nursery to 500 acres, closely planted with trees.
T. C. Maxwell & Co., Geneva, have increased their nursery to 160 acres in trees—200 are devoted to nursery purposes, and two propagating houses with 3,000 feet of glass are added.
O. B. Maxwell & Co., Dansville, successors to Maxwell, Bristol & Co.—100 acs.
Edward Merritt, Pawling, Dutchess Co.—new.
B. Millard, Pittsford, Monroe Co.—1855—18 acres.
Geo. H. Moody, Lockport, 25 acres.
Elisha Moody, 6 miles east of Lockport, 30 acres.
Ramsdell & Loud, Egypt, Monroe Co., 20 acres.
Richardson, Warren & Co., Olcott, Niagara Co.
C. W. Seelye, Rochester. 40 acres.
George Sherman, Westfield, Chaut. Co.
E. W. Sylvester, Lyons, Wayne Co., 15 acres.
Thomas & Herendeen, Macedon and Union Springs, have increased their nurseries to 80 acres.

NEW-JERSEY.

C. Davis, Jr., Phillipsburgh, opposite Easton—1858—8 acres.
George B. Deacon, near Burlington—1840.

James McLaen, Roadstown, Cumberland Co., 9 acres,

PENNSYLVANIA.

Wm. Bright, Rising Sun.
Evans & Luitweiler, York—1858—45 acs.
Thomas M Harvey, Jennerville, has sold to Isaac Jackson & Co., except the grape department, which is conducted on a large scale—140 sorts.
Wm. M. Hastings, Lebanon, Lebanon Co.
O. T. Hobbs, Randolph, Crawford Co.—grapes a speciality.
Hoopes & Brother, successor to J. Hoopes, Westchester, 40 acres.
Isaac Jackson & Co., Jennerville, 30 acres.
J. Knox, Pittsburg—small fruits.
L. Maupay & Co., Rising Sun—greenhouses and ornamentals.
S. Miller, Lebanon, Lebanon Co.—grapes and small fruits.
J. S Negley, Pittsburg—mostly ornamentals.

VIRGINIA.

Franklin Davis, Staunton—40 acres.

GEORGIA.

Fleming & Nelson, Augusta—new.

MISSISSIPPI.

W. H. Burford, Cuddy Hunk, Calhoun Co.—6 acres.

KENTUCKY.

A. L. Caldwell, Demosville.
J. S. Downer, Elkton.
John C. Gaddis, Newport—new.
Ormsby Hite, Louisville.
Wm. M. Housley, Bowling Green.
J. & W. G. Johnson, Cedar Creek—15 acs.
A. Mattison, Paducah.
John A. McKee, Cynthiana.
B. E. Randolph, Hopkinsville.
R. S. Reeves, Keysburg.

TENNESSEE.

L. C. Lishley, Nashville.
Montgomery & McGredy, Nashville.

OHIO.

E. Bonsall & Brother, Salem—25 acres.
Clark & Stalter, Lancaster, is now Clark & Hunter.
Francis Clymer, Galion, Crawford Co.
Joseph C. Coe, Sidney, Shelby Co.
Charles W. Davis, Troy.
Jas Denniston, Eaton, Preble Co.
A. Fahnestock & Sons, Toledo, added 50 acres to last year.
E. W. Harrington, Yellow Springs—20 acres.
Joseph Harris, St. Clairsville, Belmont Co.—12 acres.
George Hikes, Dayton.
Andrew Hikes, do.
W. F. Lewis, Shaler's Mills, Knox Co., 6 acres.
W. B. Lipsey, Cardington, discontinued.
McReady & Berry, Oxford—25 acres.
S. B. Marshall, Massillon—15 acres.
Miller & Swan, Enon, Clark Co.
Joseph Morris, Cardington—6 acres.
L. S. Mote, West Milton.
George R. Mumma, Dayton.
M. M. Murray, Twenty-Mile Stand, Warren Co.
G. Perdue & Sons, New Martinsburgh Fayette Co.
James B. Pullen & Son, Lebanon, Warren Co.
John Purdon, Urbana.
E. I. & J M. Vandervoort, New Antioch, Clinton Co.
Joel Wood, Martin's Ferry.

MICHIGAN.

Bragg, Curtis & Co., Paw Paw—1857—20 acres.
D Cook, Jackson, discontinued.
C. C. Cooley, Hudson—6 acres.
Harwood & Dunning, Jackson—1854—30 acres.
J. E. Inglefritz, Monroe.
H. F. Penniman, Battle Creek—15 acres.
W. L. Randall, Adrian, deceased.

INDIANA.

Albertson & Wright, Canton, Washington Co.
L. T. Bullock, Shelbyville, Shelby Co.
J. Coggeshall, Jonesboro', Grant Co.
J. J. Conly, Richmond—10 acres—greenhouse.
J. Fawcett, New-Albany—peaches.
Fletcher, Williams & Loomis, Indianapolis—70 acres.
A. Floyd & Son, Lafayette—greenhouses, &c.
James Ford, Princeton, Gibson Co.
John (not Peter) Fulhart, Munice, Delaware Co.
Hays & Hubbard, Columbus.
D. & A. Huddleston, Cottage Grove, Union Co.
Wm. Jones, Wabash, Wabash Co.
E. Kelsey, Peru.
Lee & Wooley, Kokomo.
N. Lewis, Greensbury, Decatur Co.
Millhouse & Lipsey, Butlerville—new.
Wm. Pickett, Deming, Hamilton Co.
A. M. Purdy, Scuth Bend—20 acres.
Z. S. & W. A. Rogan, Clayton, Hendricks Co.
Simson, Tenbroeck & Co., Vincennes—1351—25 acres.
Frederic Schnell, Indianapolis — greenhouse, &c.
N. Smith, Abington, Wayne Co.—evergreens.
A. Stone, Winchester.
D. Swinebout, Logansport.
J. W. Tenbroeck, Rockville, Parke Co.—1846—10 acres.
Trueblood & Lipsey, Salem, Washington Co.—11 acres.
Jesse White, Arno, Hendricks Co.—1854—7 acres.
Wm. Wildman & Co., Montezuma, Parke Co.
E. Y. Teas, Richmond—10 acres.
J. C. Teas, Raysville—25 acres—a very general collection.

ILLINOIS.

V. Aldrich, Tiskilwa—18 acres.
B. O. Curtis, Paris, (5 ms. from,) Edgar Co.—20 acres.
J. Huggins, Woodburn—20 acres.
Huntingdon & Woolworth, Rockford.
J. T. Little, Nachusa, Dixon Co.—30 acs.
M. Myers, Magnolia.
James Rees. Ridge Farm, Vermillion Co.
Prof. J. B Turner, Jacksonville.
Adnah Williams, Galesburg, 20 acres.

IOWA.

Owen Albright & Co., Bangor, Marshall Co. (not Keokuk.)
W. S. Finley, Davenport, successor to Finley & Dwire.
Suel Foster Muscatine, fruit and ornamental and green-house—20 acres.
Isaac Negus, Muscatine, (3 miles north of,) fruit—extensive.
Greenbury P. Wood, Spring Dale, Cedar Co.

MISSOURI.

Carew Sanders & Co., 5 miles west of St. Louis—20 acres.
Siegerson's nursey, discontinued.

KANSAS.

Hugh Campbell, Topeka.

OREGON.

Henderson Lewelling, Milwaukie.
Wm. Ladd, Oregon City.

RURAL ECONOMY.

Razor Strops.—Oxide of tin, as many know, has a fine sharpening quality, and is extensively used for coating the leather of strops. When they have lost their efficiency, rub them briskly for a short time across a tin vessel, and enough will be imparted for the intended purpose.

Marking Bags.—This is easily done by applying black paint with a brush through holes cut as letters, through a piece of pasteboard. But the pasteboard, unless inconveniently thick, curls at the corners after a time, and the letters are defaced. Tin plate is much better, but it is difficult to cut the letters in it. Thick *sheet-lead* is, however, just the thing, and any person who can use a knife may cut the letters through it after they have been accurately marked.

Bad Water in New Wells.—Water otherwise good, is sometimes made bad in new wells by dissolving impurities from the stones used to wall them. We knew a case of this kind, where in a few weeks the water became so fœtid that no animal, however thirsty, would touch it. The cause was suspected and the well cleaned; the second filling of water was much better; the process was repeated, and after the water was drawn out the third time it became perfectly good. It has since, for many years, been noted for its excellent water.

Quality of Different kinds of Wood.—The celebrated experiments of Marcus Bull of Philadelphia, many years ago, gave the following results, showing the amount required to throw out a given quantity of heat:

Hickory,	4 cords.	Pitch pine,	9 1-7 cords.
White oak,	$4\frac{3}{4}$ "	White pine,	9 1-5 "
Hard maple,	$6\frac{2}{3}$ "	Anthracite coal,	4 tons.
Soft maple,	7 1-5 "		

Painting Tools.—Every farmer should keep a pot of paint and a brush ready for use in his work-shop. On rainy days, paint all tools, hoes, rakes, forks, plows, harrows, cultivators, spades and shovels. Be particular to apply the paint well at the cracks and joints, where moisture

might penetrate. Repeat the process frequently. This will cost but little, and save many hard-earned dollars. A light-colored paint, as yellow ochre, will become less heated in sunshine than one of darker hue.

Cracks in Stoves, are easily and effectually stopped by a paste made of ashes and salt with water. A harder and more durable cement for the same purpose is made by mixing iron filings, sal ammonia and water.

Drying Wood.—Every one who uses a wood stove, has discovered that there is a great difference between the value of wood that is well or poorly dried. The following may be given as a scale of the different modes of drying, the best being named first:

1. Kiln-dried.
2. Seasoned several years in a dry ventilated building.
3. Sheltered a year under a good roof.
4. Corded up in open ground.
5. Corded up in the woods and shaded.
6. Partly seasoned, soured by fermentation or water-soaked.

Most kinds of wood cut in winter, and left in large logs in the woods, becomes mor or less soured and injured. If wood could be cut and split in summer, when the weather would dry it rapidly, the wood would be greatly increased in value; but as this is usually impracticable, the next best is to cut and split it in winter as fine as will be required, and then cord it up in a wood-house, well sheltered from rains, but admitting the free circulation of the air.

DAIRY ECONOMY.

Winter Butter.—The different modes of treating the cream and milk in winter, to make good butter, are greatly inferior in their results to the effects of giving the cows themselves a regular supply of sugar beets or carrots, the latter, as we think, being much the best. They will nearly double the ordinary amount of milk, and increase its richness, while the butter it produces has that yellowness and fine flavor peculiar to that commonly made from pastures. It is always a loss of quantity for butter to come too soon by churning; but sometimes its gathering is too long delayed after the minute granules of butter are formed. The process may be often hastened by dropping into the churn at this period, a small lump of butter, which serves as a nucleus around which these granules quickly coagulate.

Damp Stables.—A farmer discovered after taking possession of a newly purchased place, that his horses were becoming poor, diseased, and incapable of much labor. His cows became sickly, their milk diminished, the butter was bad, four lost their calves, and two died of scours. The dampness of the stable was the suspected cause. It was low, under trees,

and with a northern aspect. It was replaced by another on a dryer spot, when the difficulty ceased.

To Make Cattle thrive in Winter.—There are certain requisites to be constantly observed, namely, the following:

1. To feed *regularly*, and preventing fretting for expected meals.
2. To give enough, but never over-feed.
3. To feed often, and moderately at a time.
4. To furnish constantly a supply of good water.
5. To shelter from storms.
6. To rub them clean, and give clean litter.
7. To give them a portion of carrots or beets daily.
8. To keep their stables properly ventilated and free from bad air.

Stabling Cows.—Different experiments show that stabling milch cows during an average of northern winters, increases their milk about *one-third.* In very severe weather the milk will be doubled; while in mild days less advantage results.

To Winter Village Cows.—One hundred bushels of carrots may be raised on ten square rods of *very rich ground* in favorable seasons, and in almost any season on sixteen square rods, or four rods square, one-tenth of an acre. They will keep a cow all winter in the finest condition in connection with some hay, and furnish rich milk and butter. A few square rods of sorghum will supply fodder nearly all the autumn, of the richest character, but should be cut short in a stalk-cutter.

Wintering Cattle.—Every farmer should reserve his best hay for the latter part of winter and spring. Let the animals rather improve instead of their falling away as warm weather advances. Let them enter the pasture in good condition. It is an old axiom, "cattle well wintered are half summered."

Green and Dried Fodder.—The following are the results of experiments made many years ago in New-England, to determine the loss of weight by the drying of different grasses. They will prove interesting to graziers. The experiments were made in 1822 and 1823. The white clover of 1822 grew in the shade; that of 1823 in the sun:

			1822	1823
100 lbs.	green	white clover gave,	17½	27
"	"	red clover,	27½	25
"	"	herds' grass, (timothy,)	40	39
"	"	cornstalks,	25	25
"	"	red-top,		46
"	"	couch grass,		48
"	"	fowl meadow,		53

Packing Butter.—Let the firkin contain as much as possible—that is, pack as *solid* as the work can be done.

Feeding Hay to Animals.—Much fodder is sometimes wasted by giving too much at a time. The breath of the animals condense upon it in cold weather and render it unpalatable, and they refuse it. Feeding often and but little at a time is true economy.

RULES FOR BUSINESS.

How to Succeed in Business.—Ricardo's rules were:

1. Cut short your losses.
2. Let your profits run on.

In order to do this, one must have *experience*—and to avoid a too costly experience, begin small. Feel your way. Bonaparte had a quick and powerful mind; we may learn from him, observing to do good with our knowledge, instead of evil as he did. When in Egypt, he and many of his officers were riding out in a dark evening on the sea beach, where it was very wide. Suddenly the tide came in rapidly, and the water grew every moment deeper where their horses stood; they could not see which way was dry land, they became alarmed and bewildered, and destruction threatened them. Bonaparte seemed never to fail for an expedient. He ordered all to form a circle, with horses' heads outwards. They did so. He now ordered all to ride ahead; if any found the water growing deeper, they were to turn about; if any found it growing shallower, they were to ride on, and all the rest to follow. This brought them to dry land. It is so with business. Proceed cautiously in different directions; if failure results, wheel about; if success attends, go ahead. This is the way to carry out Ricardo's rules, " Cut short your losses—let your profits run on."

Another Requisite for Success.—*Principle*—stern, unflinching principle, is the best foundation for successful business. Those who have it not, can hardly carry out on all occasions the great law for comfortable, safe and prosperous progress through the world, namely, " Honesty is the best policy." A careful estimate has been made that on an average every dollar which a man makes by cheating, he loses at least twenty, and some say at least a hundred dollars, by the bad name which he sooner or later surely builds up for himself. If detected in fraud, his course is at once arrested; if not detected, he goes on till some gross commission either sends him to prison, or imparts such an odor to his character that every man of integrity shuns him. We have known men of very moderate talents appointed to important and lucrative trusts, on account of their known faithfulness and honesty, when much "smarter" men of doubtful character, could get no employment.

Getting Rich by Speculating.—We once inquired of an old resident of New-York city, who had seen much of the active business men of that place during most of the present century, if he had known one who had pursued a business strictly of the character of the speculator for thirty years, that came out rich. He said he did not know any. " All our rich men have accumulated their wealth by gradual and constant accessions." We have known many men who were pointed out as "immensely rich"

through speculation, but in every case that we can recollect, they afterwards failed.

A Rich Estate.—The best legacy which a man can leave to his children, is *the ability to take care of themselves.* Fit them for active, responsible business, and they have at once an income; but this income is as much greater in value to them than the same income left in money, as activity and useful employment are better than idleness and lounging and dissipation. Give a young man good moral habits and a good practical thorough school education, (which by the way need not necessarily be acquired at schools,) and he can secure a salary of perhaps two or three hundred dollars at first, and in successive years up to a thousand dollars. He is then worth a thousand dollars a year—the interest at six per cent. on over sixteen thousand dollars, his real value counted in money. But a poor young man who can make a thousand dollars a year, is worth far more than a young spendthrift who has sixteen thousand dollars, because he is more useful in many other ways, and is making himself happy instead of miserable.

"What Business shall I Follow?"—This question is often asked, and the proper answer may be, Any useful and legitimate business. That is usually the best business for a man which he can perform best. He must be well fitted for whatever he undertakes. After that, success depends upon THE MAN, and not on the business. We have known some men of deficient energy and capacity who failed with the most favorable commencement; and others who, under great difficulties, persevered without faltering until eminently prosperous.

But it is all-essential to *stick to your business.* Several years are often required to attain a proper knowledge of all the ramifications of a trade. A man who was clearing five thousand dollars a year, remarked, "for the first five years I made almost nothing"—by that time he had accumulated great experience. Another, a person of high capacity, changed his occupation eight times in fourteen years—he began rich and is now poor.

How to Lengthen the Season.—Farmers in the North often complain that the season for labor and growth is too short. They may lengthen it by underdraining. Land, which under ordinary treatment must lie untouched in spring several weeks for the water to run off and dry up, is rendered dry in two or three days if well ditched, giving the farmer the control of his land and the privilege of working it from the opening of spring.

Care of Carriages.—Those who would keep their buggies and carriages in good order, should place a wrench on every nut at least once a month. This will save nuts, save bolts, and prevent rattling, and wear and tear.

GRAFTING KNIVES.

A correspondent of the COUNTRY GENTLEMAN furnishes the accompanying drawings of grafting-knives. He says: There is a great gain in using a tool best adapted to its work, and I think those unacquainted with fig. 168, will, after an explanation of its advantages, desire to procure it. Fig. 167 is taken from April number of the American Agriculturist. Fig. 168 is the knife used by most western grafters. I have handled both. The wedge point, *a*, should be made of steel, well tempered and not of iron, (as was the one I purchased, and which gave me much trouble by bending,) for the point, in pressing open the slit just before placing the graft, receives a considerable strain.

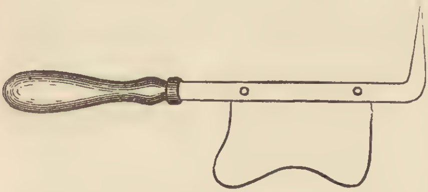


Fig. 167.

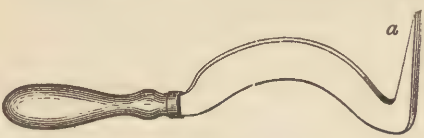


Fig. 168.

Fig. 167 would be as good as fig. 168, if you could always be in a favorable position to handle it; but limbs are sometimes very difficult to get at. In such cases, fig. 168, from its form, is preferable, and a man can in a day accomplish more with it, and with greater ease, for in driving in the wedge point *a*, there is no projecting knife-blade in the way of your mallet, (which should be a round piece of hard wood,) to interfere with the direction of the blow, or worse still, in some awkward positions, there is a risk of hitting your hand against the blade. I mention this feelingly. No. 168 is frequently made too thick in the blade, but when properly made, is a very satisfactory tool to work with, much more so than the other, according to my experience.

Another correspondent of the same paper says: I send you a rude draft of a good grafting-knife and chisel, (fig. 169.) Those who have used them, say that the advantage of this form is in having the instrument *balance* when the wedge is in the stock, so that it does not fall out. The hook is for hanging on a limb.

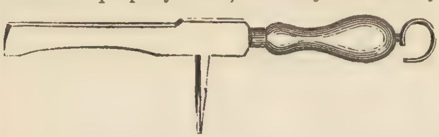


Fig. 169.

AUTUMN AND SPRING TRANSPLANTING.

Autumn and spring each have their peculiar advantages for setting out fruit trees. The advantages of autumn transplanting are, the soil becomes well settled about the roots, and the trees are prepared to make an early start in the spring. The disadvantages are that trees are always made more tender by removal for the endurance of the first winter; and the soil hardens on the top into a crust, and the trees will not then grow so well as when the soil has been lately stirred in setting out, as in spring. Hence, tender trees in severe climates should not be transplanted in fall, unless they can be protected by a shelter from the winds or by a screen of evergreens, and unless the ground is dry and well drained, naturally or artificially, so as to avoid the injurious results of freezing about the roots. Hence, also, that numerous class of cultivators who never cultivate their young trees at all, should always set in spring, for in doing so the trees will be more apt to have a mellow soil about them, during the early part of the season, than if the soil has become hardened by setting all winter.

Unless the locality exposes them much to cold wintery winds, and to late fall rains, which cannot drain off, we prefer setting so hardy a tree as the apple in autumn—intending, of course, to keep the soil mellow by cultivation the following summer. Far more depends on good after-culture, than on any time or mode of setting out. Ten times as many trees die of subsequent neglect, as from any want of care and skill in transplanting.

As for the best crops to plant among young trees, we should prefer to leave the earth entirely bare, and kept always mellow, for a distance from each tree as far on *each* side as the height of the tree; but those who cannot be persuaded to do this, should plant only *low, hoed crops*, such as potatoes, beets, turnips, &c., and avoid everything that is sown, whether grain or grass.

Product of Thirty Acres.—A. J. Perkins reported some years ago in the Maine Farmer, the following amount of crops which he had raised from thirty acres, viz: 700 bushels of potatoes, 80 bushels of barley, 25 bushels of beets, 15 bushels of wheat, 10 bushels of beans, 4 tons of mowed oats, 16 tons of hay, 40 bushels of corn, 20 bushels of carrots, 75 chickens and turkeys, and a large quantity of garden vegetables. One hog was killed weighing 390 lbs., 400 lbs. of butter were made, and 3 cows, a yoke of oxen, 2 heifers, 2 steers, 8 sheep, and 4 pigs, were kept on the place. These products, besides the keep of the animals, at present average prices, we find to amount to more than *six hundred dollars.*

EARLY MELONS AND SQUASHES.

Melons, cucumbers, and squashes, as gardeners well know, are very difficult to transplant. Their roots quickly spread in every direction, and they are sensitive to the mutilation they must necessarily receive when the work is done in the ordinary manner. Various expedients have been resorted to. One, which has succeeded tolerably well, is to plant the seeds in an inverted piece of turf, embedded in the earth of a hot-bed, and before many leaves are made, to remove the young plants, with the pieces of turf, to the open ground. There are but two difficulties here. The turf does not allow the plants to become large enough before removal; and grass is apt to spring up from the pieces.

A better way is to make small open baskets, set them in the hot-bed, and plant the seeds within them. The baskets do not impede the roots, and when the plants are large enough, the whole, basket, earth and plants, is removed and set in a hole previously cut in open ground. The baskets are easily made by tying together with twine, as shown in fig. 170, two basket splints, basswood or other bark; then with another piece tied together at the ends, form the hoop, fig. 171; thirdly, bring the ends of the two first-mentioned pieces down over this hoop, tying by twine, and the basket is made. (fig. 172.) If the soil is light and friable, it will be necessary to interweave a few more splints or twigs; but if tenacious, a more open basket will do. An active hand will make many of these baskets in an hour; and they will not only give earlier results, but save largely from squash bugs and other insects.

Fig. 170.

Fig. 171.

Fig. 172.

The most Perfect Drain.—Tubular tile, with collars, will outlast all other modes of laying drains. The water will enter freely under the collars, at the joints, but no portion of the soil can enter, except it be in turbid water. The water will not be turbid, if the tile is three feet below the surface, but will be thoroughly filtered in passing through that depth of soil. Shallow drains, for this reason, last only a few years, and then become choked with deposits. Broken horse-shoe tile, just large enough to encase the pipe tile, forms good collars for the joints. Nothing secures the tile from settling out of place equal to collars.

Milking in Silence.—At the Farmers' Club at West-Cornwall, Ct., one of the members observed that no talking should be allowed while milking was going on. Another said he had discharged a man because he would talk and interrupt the milking in his dairy, and in three days the increase of milk was equal to the man's wages.

WOOL TABLE.

A correspondent of the Country Gentleman, furnishes the following description of a wool table which he has used several years with satisfaction. It consists of four boards, six feet long and one foot wide, with the exception of the board for the bottom of the box, which is ten inches. This is large enough for Merino fleeces weighing four to six pounds; twelve inches would be sufficient for the largest coarse-wooled fleece. These are laid on two pieces of 3 by 5 scantling, three feet ten inches long, and the first, *a*, and third one, *b*, (fig. 173, the bottom of the box,) are nailed; the other two boards, *c*, *c*, are fastened to *b* with hinges; *d* is a piece of board nailed at the end of *b* to bring the sides of the box (*c*, *c*,) against, which are held there by catches.

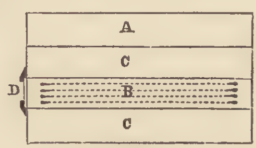


Fig. 173.

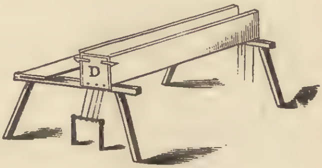


Fig. 174.

It is supported by four legs, which are movable, and when stored away occupies but little space. The twine is passed up through the bottom of the box near *d*, (fig. 174,) and across the bottom in grooves, so that the wool will not disturb them, and fastened by drawing them down in notches made with the saw. The dotted lines show the grooves.

In using, the fleece is laid on in the usual way, and the sides rolled together; then the sides of the box are raised and held by the catches, (forming a box;) the fleece is then rolled so as to leave the shoulder exposed to view, and tied; the catches are then raised, and the sides of the box drop, leaving the fleece at liberty on top of the table.

The advantages of this table over those commonly used with a box at the side, are, the box at the side is in the way when rolling the fleece; it saves the trouble of working the fleece in and out of the box, besides often tearing it, and is much easier to construct, and less expensive.

Milking Young Cows.—A recent agricultural writer has said that young cows, the first year they give milk, may be made with careful milking and good keeping, to give milk almost any length of time deemed desirable; but that if allowed to dry up early in the fall, they will, if they have a calf at the same season, dry up at the same time each succeeding year, and nothing but extra feed will prevent it, and that but for a short time.

CLEANING SEED WHEAT.

John Johnston of Geneva, one of the most thorough and successful farmers in this country, as all our readers know, says that he quit raising chess *twenty-eight* years ago—by never sowing it. He has not raised a bushel of it in all that long period on his extensive wheat farm. Thirty-seven years ago he obtained eight bushels of chess in every hundred of wheat. His mode of cleaning seed is the same in substance that we have practiced thirty years ago, but will bear repetition, and we therefore give it as recently described by him:

My plan is to take out the fanning-mill riddles; some call them screens; I call the lower one only a screen—it takes out mustard seed and cockle *in part*. After the riddles are out, take off the shaking rod, or at least the one nearest the wings or fans. Then let one man turn the wings or fans by the crank or handle, as usual; let another pour the wheat into the hopper from a basket or any other vessel—a tin-pail answers very well—let him pour the wheat in regularly and not very fast, if much chess. Let the man turning keep up a steady wind; he need not turn very fast. Have a boy, or a girl, or a man, or a woman if you choose, to take back the clean wheat as it comes down from the mill, and I will guarantee that every chess seed will be blown out. The man pouring in the wheat ought to be *boss*, to make sure that the man turning does not slack up too much, or that he don't stop turning until the wheat and chess are all out of the hopper, else it may fall down amongst the clean wheat. If the wheat is 60 lbs. to the bushel or over, very little, if any, will be blown out with the chess. As considerable will lay on the cockle and mustard screen, when that is going to be put down, it is safest to scrape back the upper part with the hand, because if there is chess anywhere among the wheat, it will be there. Now if this is done precisely as I direct, and if the wheat is not made entirely free of chess, unless three chess seeds are sticking together, which is sometimes the case with the top seeds on the main stalk, in which case there may be some left in the wheat; still a little more wind will blow them out. If any man will try it and cannot do it, send for me, and if I cannot do it to perfection, I wont ask them to pay my traveling expenses.

Time of Harvesting Wheat.—An Illinois correspondent of the Am. Agriculturist, incited by a statement of the advantages of early cutting, tried the experiment on a field of 50 acres last season. The bulk of the crop first cut, weighed $62\frac{1}{2}$ lbs. to the measured bushel. The part of the field left until fully ripe before cutting, gave wheat weighing but 58 lbs. per bushel—making a difference of nearly one hundred bushels on the whole field in favor of early cutting—from ten to fourteen days before full maturity.

TO MAKE FARMING PROFITABLE.

Every beginner in farming, by securing the following essentials, will succeed:

1. Buy no more land than there is capital enough to pay for, with one-third more surplus—for a small farm, free from debt, with plenty of means to stock it, enrich it, and carry on its work, will yield more than a larger one, encumbered with debt, conducted feebly in every part, with bad fences, poor implements, bony animals, weedy fields, and thin crops.
2. Lay out the fields in best order—so as to admit a systematic rotation, and to give ready access to every field at all times without passing through other fields.
3. Provide good fences and necessary gates—and valuable time will not be lost in driving out intruding animals, nor crops lost by their depredations.
4. Furnish good farm buildings, to secure properly the crops, and to afford shelter to animals.
5. Select the best animals and the best implements that can be secured for a reasonable price.
6. Bring the soil into good condition by manuring and draining, and keep it so by a judicious rotation.
7. Effect a clear and systematic arrangement of all the work, so that there shall be no clashing or confusion.
8. Employ diligence and energy, and adopt careful management.

Pumping Water up a Slope.—Below is an inquiry published some weeks since, to which we have been favored with the following answer: Can I bring water 6 or 8 rods by a suction pump, if the pump stands on ground 6 feet above the surface of water in the well or spring? Would it be better and cheaper than to build a cistern?

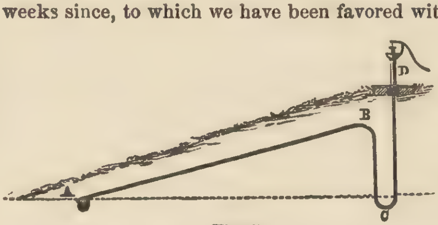


Fig. 175.

Answer.—Lay the pipe in the direction A B C D, (fig. 175,) or in any other direction touching A C D. C being lower than A, water will not flow back to it. Lay below frost. A. Spring—D. Pump—Dotted line, Level.

PACKING TREES FOR TRANSPORTATION.

SEVERAL million fruit trees are every year purchased by the farmers of our country. A large majority of these are conveyed long distances from the nursery by railway. Much of their safety from injury on the road, and their consequent success when set out, depends on the manner of packing. Trees may be packed so as to open from the bundle or box, after being tumbled over iron rails a thousand miles or more, as fresh, plump, healthy, and uninjured, as the moment they were lifted from the mellow soil; and they *are* sometimes packed so as to become bruised, barked, and hopelessly shrivelled, before they have travelled a tenth part of that distance.

The farmers who pay the three million dollars yearly for fruit trees, should understand well the difference between good and bad packing.

Whether encased in bundles or boxes, it is absolutely essential that trees be protected from bruising, and that the roots be kept constantly moist from the moment they are dug up, till they reach their destination. The first named object is accomplished by sprinkling straw through every portion of the mass of trees; and the latter by first dipping the roots in an artificial bed of thin mud, and then imbedding them in damp moss. The mud or the moss alone may answer for very short distances, (the moss should, however, never be omitted;) but as there are frequently unexpected detentions, the best nurserymen always pack about as well for a journey of fifty miles as for two thousand. The additional labor is but small—the benefit may be great.

Packing in boxes, which is always best for long distances, does not require so much practice, although as much care as in bundles. If the trees are all well encased in straw, or properly protected by it on every side and through every part; the roots shielded from the dry air as already stated; and sufficient pressure given to them to prevent chafing and rattling, they cannot become easily injured. The boxes, if large, need the additional strength of iron hoops at the ends or corners.

To pack a bundle, first provide two simple blocks of wood, like that shown in fig. 176, into which two diverging stakes are inserted, loosely, so as to be withdrawn easily. Place these a few feet apart, to form the

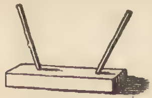


Fig. 176.

trough for building the bundle. Lay the trees in this trough, perfectly parallel, and with the roots together, sprinkling straw among the stems and branches, and damp moss among the roots as the bundle progresses, until enough are ready. Fifty medium sized trees will make a fair-sized bundle. Then tie it up with three or four twisted straw bands, as tightly as one man can conveniently draw. This may be facilitated by using first a broad leather strap to draw the bundle

together. The strap may be 2 inches wide, 8 feet long, with a buckle. The bundle is then ready for receiving the straw.

Next, place upon and across the little truck or wagon represented in fig. 177, four strings or cords, then a layer of rye straw, to form the outside coating. As the bundle is longer than the straw, the latter must be spliced, which is effected by first placing a layer towards the place for the roots of the trees, and then another layer overlapping this, towards the tops. Place within the side boards, other portions of straw, and finally cover the top, observing now to lay the straw first on the tops, and lastly on the roots. Then tie together the ends of each of the four strings, which will hold the straw in place. Raise the bundle a few inches by placing beneath it short pieces of scantling, to admit passing the cord under. Then apply the rope connected with the windlass, as shown in fig. 177, by simply passing it once around the trees. A few turns of the crank will draw the bundle with great force compactly together—at which place pass a strong cord (one-fourth or one-third of an inch in diameter,) and secure it by tying. Slacken the rope; move truck a foot, tighten the rope again, and add another cord. In this way proceed from bottom to top, till the straw is so firmly secured by the cords, that no handling, however rough, can displace it. By tying each cord separately, the rest will hold the straw, if one happens to become worn off or cut. Add moss to the exterior of the roots, encase the moss in damp straw, and sew on a piece of strong sacking or gunny cloth, and the bundle is completed, as shown in fig. 178.

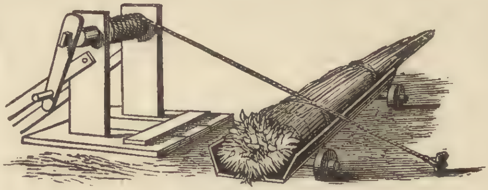


Fig. 177.

Fig. 178.

The former practice among nurserymen, was to draw the bundle together by dint of stout pulling by hand; but the present mode by the use of a windlass, is not only many times more expeditious but much better—as it was formerly almost impossible to bind on the straw in so firm and secure a manner, as to withstand all the kicks, thumps, and rough-and-tumble handling of modern railway hands, without displacement.

The following dimensions may be useful to those who wish to construct this packing machinery: Windlass 3 feet high to top—posts 15 inches apart inside—cylinder 4 inches in diameter—rope about 18 feet long. The truck is about 2 feet wide between the wheels—8 feet long—the axles 6 feet apart—wheels 7 inches in diameter.

When trees are always boxed, they may be secured advantageously in small bundles by this mode, for placing in the boxes.